

A M c G R A W - H I L L P U B L I C A T I O N

# Chemical Week



High-pressure polypropylene hunt speeded in Germany, U.S. . . . p. 27

New hydraulic fluids readied for auto centralized systems . . . . p. 46

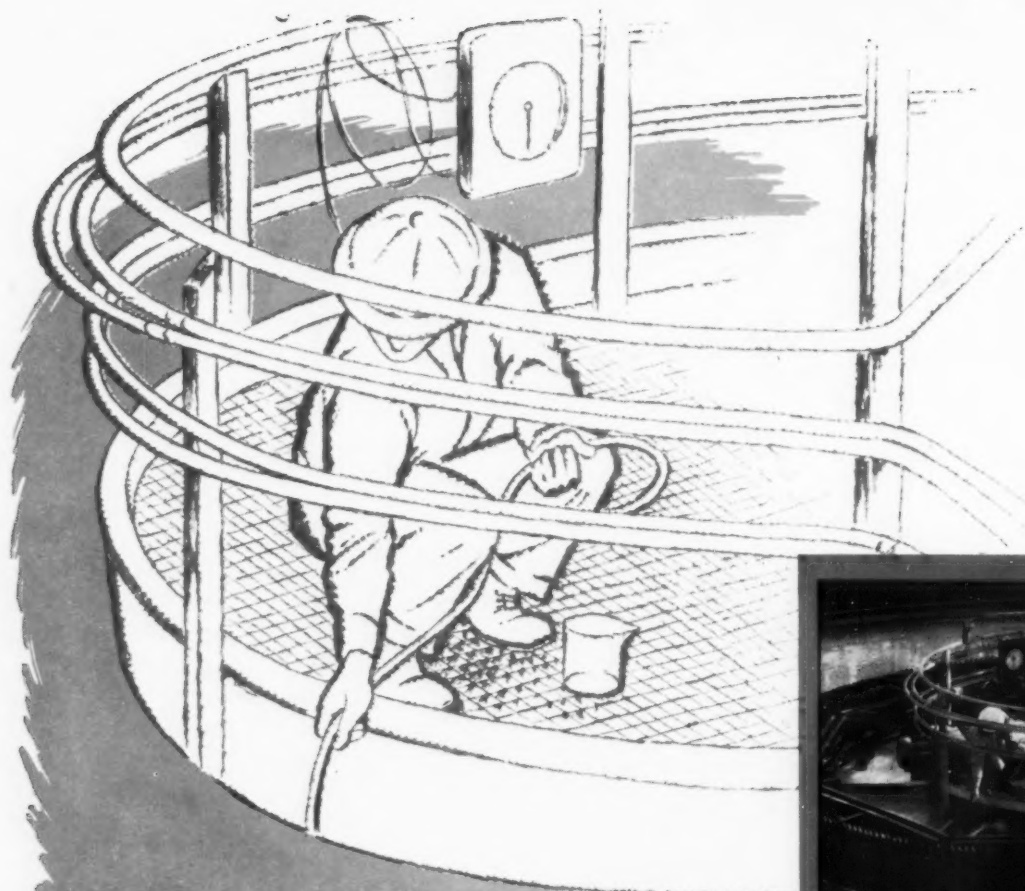
***Building in color: CPI challenge . . . p. 52***

New filtration tools broaden uses of old clarification idea . . p. 61

CW Report: Rundown on 437 new chemicals launched in '59 . . p. 84

January 30, 1960

STEWENS RICE  
UNIVERSITY MICROFILMS  
315 N 1ST ST  
ANN ARBOR MICH

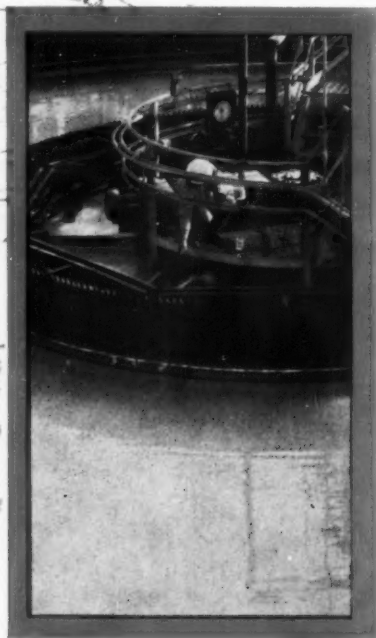


*this "brine thief"*  
helps guard the quality  
of **WESTVACO® CAUSTIC!**

By periodic thief-sampling and analysis, he double-checks the automatic controls that regulate the continuous flow of brine to our modern electrolytic cells. He makes doubly sure that optimum salt concentration is maintained.

This is another example of the extra care on which the consistent high quality of Westvaco Caustic depends. It's one more good reason for you to depend on Westvaco to supply your caustic needs.

We're located at South Charleston, W. Va., ready to give you unbeatable service from a newly modernized and expanded plant. Technical service facilities have been enlarged, too, so we're better than ever able to serve you in every way.



**CAUSTIC SODA**

Liquid 73%;  
Liquid 50%, Regular and  
Low-Chloride Grades;  
Flake, Solid and Ground.

**CAUSTIC POTASH**

45% and 50% Liquid;  
Flake and Solid.



*Putting Ideas to Work*

**FOOD MACHINERY AND CHEMICAL CORPORATION**  
**Westvaco Chlor-Alkali Division**

General Sales Offices:

161 E. 42nd STREET, NEW YORK 17





Milano—T. M. Columbus Coated Fabrics Corporation, Columbus, Ohio

## To capture the beauty of moiré and much more—PLIOVIC!

**As you can see** from the above, the soft shimmer of moiré has been captured, for the first time, in fabric-supported vinyl upholstery.

**It's called Milano** and results from a combination of fine skills and materials, including PLIOVIC.

**The primary advantages** of using PLIOVIC as the basic resin are: 1. It blends readily, fuses at low temperatures, processes easily. 2. It embosses easily and faithfully. 3. It helps assure lasting adhesion to the knitted fabric backing. Other benefits: Excellent heat- and light-stability plus good over-all physical properties.

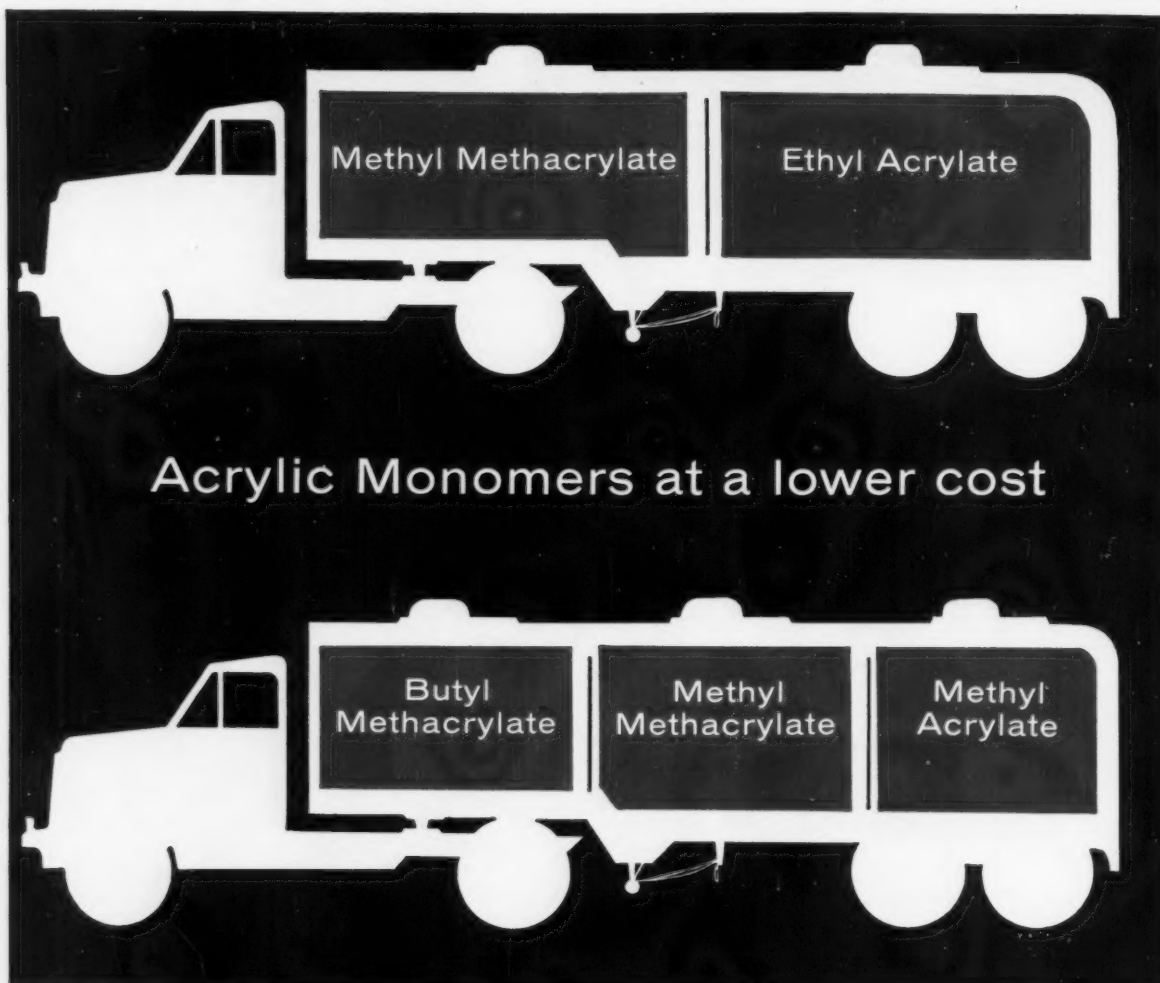
**How can you** use PLIOVIC to advantage? Write for details, including the latest *Tech Book Bulletins*, to Goodyear, Chemical Division, Dept. M-9417, Akron 16, Ohio.



# GOOD YEAR

CHEMICAL DIVISION

Pliovic—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio



## Acrylic Monomers at a lower cost

The widest selection of acrylate and methacrylate monomers available from any one source plus delivery in compartmented tanktrucks can mean savings in money and time when you choose Rohm & Haas as your acrylic monomer supplier. This means that two or three monomers can be shipped at the same time, and as long as a tanktruck is filled, you pay the bulk price for each monomer. Savings such as this also apply to mixed truckloads and carloads of monomers in drums. And when you order from one source, you simplify your paper work and save time by writing one order instead of several.

Request information today on the convenience and savings made possible by buying acrylic monomers from the broad range offered by Rohm & Haas.

*Write to Dept. SP-6 for samples, and technical literature relating to your processes.*



*Chemicals for Industry*

**ROHM & HAAS  
COMPANY**

WASHINGTON SQUARE, PHILADELPHIA 5, PA.



**Acrylic Monomers available commercially from Rohm & Haas . . .**

**METHYL ACRYLATE • ETHYL ACRYLATE • BUTYL ACRYLATE • 2-ETHYLHEXYL ACRYLATE • METHYL METHACRYLATE • ETHYL METHACRYLATE • BUTYL METHACRYLATE • HEXYL METHACRYLATE • DECYL-OCTYL METHACRYLATE • LAURYL METHACRYLATE • STEARYL METHACRYLATE • GLACIAL ACRYLIC ACID • GLACIAL METHACRYLIC ACID**

## TOP OF THE WEEK

JANUARY 30, 1960

- ▶ **Nickel heads for a big year; supplies are ample, demand high.**  
One rub—Cuba's attitude toward mineral exports ....p. 37
- ▶ **Chemico sees business opportunity in boosting world food output.** Its stake: designing ammonia, fertilizer plants ....p. 41
- ▶ **Key to getting most out of trade shows:** first, settle on objectives, then build showmanlike display to achieve them .....p. 66

### 16 BEHIND THE NEWS

CHEMICAL WEEK publisher Wallace Traendly promoted; Robert Muller selected as new publisher.

### 16 LETTERS

### 16 MEETINGS

### 23 BUSINESS NEWSLETTER

27 High-pressure polypropylene may be next big plastic development. Current problem—avoidance of waxy coproduct.

28 Sunray Mid-Continent Oil's new petrochemical projects based on captive aromatics production.

28 Thiokol Chemical, bolstered by new Pershing and Minuteman rocket contracts, sees more company growth, but at slower pace.

29 Costs of business going up? Leading states seek new revenue from industrial plants.

30 Chemical competition in Europe—latest figures show "Common Market" nations making strong new gains.

### 33 WASHINGTON NEWSLETTER

### 37 MARKETS

Ample supplies help stimulate hike in nickel consumption; 255 million lbs. consumption predicted for '60.

### 41 ENGINEERING

New management policies set stage for Chemico's growth in worldwide engineering and construction.

44 Cesium-ion engine proposed for outer-space propulsion.

### 46 RESEARCH

Prospect of centralized hydraulic systems for autos spurs research on new fluids.

48 Spencer launches "polymorphous" polyethylene film. Feature: clarity.

### 52 SPECIALTIES

Unorthodox building materials are creating new markets for chemicals in building construction.

55 Meer Corp., natural products seller, holds onto markets despite competition from synthetics.

### 61 PRODUCTION

Process plants demand better clarification filters—but lack of standards slows filter improvement.

### 66 SALES AND DISTRIBUTION

CPI graded "poor" for trade-show exhibits, advised to spend more time on showmanship.

68 Arizona copper mines get new hopper car that promises cheaper, quicker handling of materials.

### 71 TECHNOLOGY NEWSLETTER

### 75 ADMINISTRATION

Monsanto's 17 Business Climate Committees report on roles in company civic affairs program.

76 Standard Oil of New Jersey's big institutional advertising project: sponsorship of TV's "Play of the Week."

76 Pennsylvania sets up new commission to control air pollution.

### 81 MARKET NEWSLETTER

### 84 CHEMICAL WEEK REPORT

The 437 promising new chemicals launched in '59.

### 104 BUSINESS BENCHMARKS

ILLUSTRATIONS ON COVER, PP. 52, 53, COURTESY STANDARD OIL CO. OF NEW JERSEY

**45,454 copies of this issue printed**

Vol. 86

No. 5

Chemical Week is published weekly and copyrighted (© 1960 by McGraw-Hill Publishing Co., Inc. 330 W. 42nd St., New York 36, N. Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa. Second-class postage paid at Philadelphia. Subscription: \$3/year in U.S.A. Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week. Please see page 20 for subscription requirements.

Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N. Y.

A black and white photograph showing a hand holding the top edge of a multiwall bag. The bag is dark and has the words 'NEW HIGH POLY' printed on it in large, bold, three-dimensional block letters. The background is dark and textured.

**NEW HIGH  
POLY**

## **GIVE YOUR MULTIWALL BAGS**

**H**ERE ARE THE FACTS: Coatings of BAKELITE high-density polyethylene DGD-7401, on Kraft multiwall bags give equal or better moisture barrier protection than low-density coatings twice the weight.\* This means new opportunities for important savings that you should investigate right now!

The coatings also provide greater resistance to heat, grease and oils. Laboratory tests show high-density coatings on paper are *over 20 times* more effective than low-density coatings as a barrier to high penetrating oils.

Greater package strength too—higher hardness, better resistance to



# DENSITY ETHYLENE COATINGS...

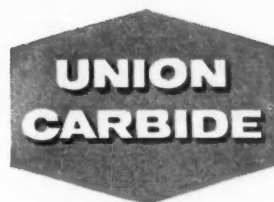
## A BETTER MOISTURE BARRIER AT LOWER COST

scuffing and abrasion—plus high chemical resistance and improved slip properties.

For complete technical information, see your packaging supplier, or write Dept. AA-48M, Union Carbide Plastics Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. *In Canada:* Union Carbide Canada Limited, Toronto 7.

It pays to use packaging made with BAKELITE Polyethylene.

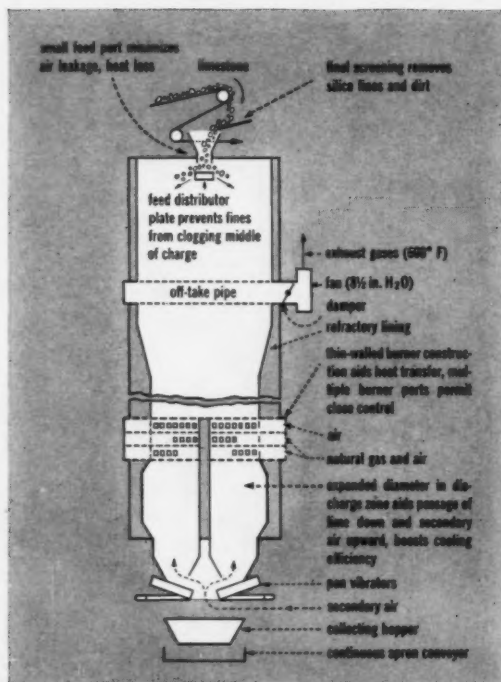
\*Determined in a 360 hour moisture pickup test conducted by a leading independent research laboratory on 50 lb. Kraft bags, polyethylene coated, and filled with calcium chloride.



BAKELITE and UNION CARBIDE are registered trademarks of UCC.

# news briefs...

ON THE CREATIVE USE OF  
M & C PROCESS MATERIALS



## \*New Advanced-Design Lime Kilns

produce top quality lime at high throughput... Chemstone will design, construct, even operate these kilns at your site

Pictured is a basic improvement in lime kiln design by Chemstone Corporation\*\*. Design makes use of "slip" principle of charging and discharging (replacing conventional "hang" operation)—giving better heat transfer control. Initial installations at Chemstone's Strasburg, Virginia plant resulted in: *higher quality lime*—silica down from 1.2-1.7% to 0.75%; *50% increased output*—a production rate of 2 tons/day/sq. ft.; *high thermal efficiency*—under 5 million Btu/ton lime, well under industry average; and low manpower requirements.

Premium quality lime is available from the Strasburg, Virginia kilns. However, if your lime demand is great, Chemstone will design, construct and even operate them at your site on a fee basis. This is a "starred" item. Use the coupon for details.

\*\*A subsidiary of Minerals & Chemicals Corporation of America

## New Foundry Sand Binder

gives finer finish to non-ferrous castings—brings major cost savings

From M & C's Research Center and extensive field testing now comes Britecast "O"—an attapulgite-based binder and thickener for oil-bound foundry sands. *Big advantages to foundrymen:* good permeability and excellent green strength. *Results:* finer, more detailed surface finishes, lower production costs. Check the coupon for detailed data on this new M & C development.



Typical aluminum casting from a Britecast "O" oil-sand mold. Note unusual freedom from surface defects. Conversion from natural sands to Britecast "O" sand increased rate of mold production up to 60%.

# Minerals & Chemicals Corporation

7546 Essex Turnpike, Menlo Park, New Jersey

*Leaders in creative use of non-metallic minerals*

Export Department: Room 150, Garden State Parkway, Menlo Park, N. J. (Cable Address: "MICOR")

## \*Sticky chemicals kept free-flowing by Attacote® coating agent

Attacote's naturally high liquid and vapor absorbing capacity shields hygroscopic chemicals and fertilizers from moisture and assures their flowing free at point-of-use. Applied easily by tumbling, Attacote shows high adherence to the surface of the material conditioned all through packaging, transport, and storage. Fine particle size, low bulk density, inertness and non-toxicity contribute to performance. Quantity requirements are small and keep Attacote a low-cost answer to this bothersome problem, for example:

ammonium nitrate prills†	2-3% Attacote
ammonium sulfate	1/2%
urea	1/2-1%
Granular high analysis fertilizer	1/2-1%
resins	1-2%
organic antioxidants	1-2%

Coupon will bring details on this tamer of sticky chemicals . . . this is a *starred* item. Check it.

†For explosive grade or where low ammonia release is especially important, use Attacote "C" which has its surface alkalinity neutralized to make ammonia release less likely.

## Waxes give up last traces of odor, taste to Porocel® adsorbent

More top quality waxes are produced with M & C's Porocel than with any other adsorbent. Porocel is in this top position because of its superior efficiency for finishing waxes . . . even highly-hydrogenated waxes benefit from a final clean-up by Porocel. Paraffin waxes, micro-waxes, and petrolatums give up color bodies and lose organic acidity to meet the tightening specifications imposed. Get the complete data on Porocel adsorbents . . . use the coupon.

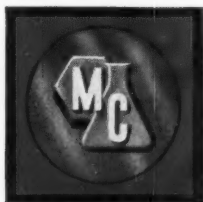


Use this quick two-check coupon ►

- ✓ your product interest . . .
  - ✓ what you need to get tests started . . .
- we'll fill your requests immediately.

For more data, see your 1960 Chemical Materials Catalog, pages 451-458

# of America



MINERALS & CHEMICALS CORPORATION OF AMERICA  
7546 Essex Turnpike, Menlo Park, N. J.

I'm interested in:

- ☐ \*Chemstone Kilns; ☐ Britecast "O" binders;  
☐ \*Attacote coating agent  
☐ Porocel adsorbents for \_\_\_\_\_ (specify use).

Please send me, without obligation:

- ☐ data; ☐ samples; ☐ prices; ☐ technical representative

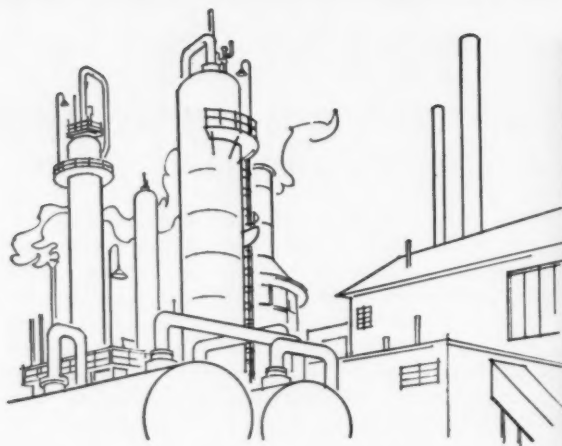
name \_\_\_\_\_

title \_\_\_\_\_

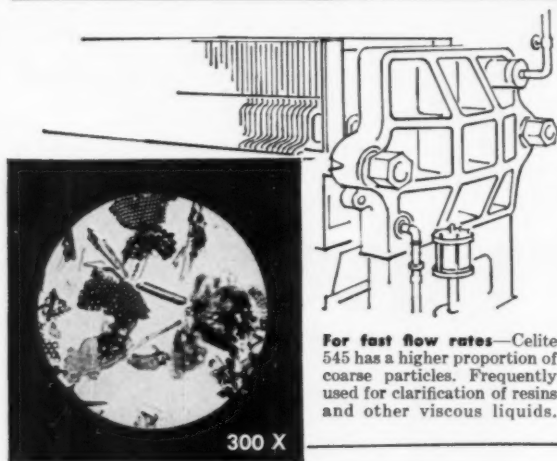
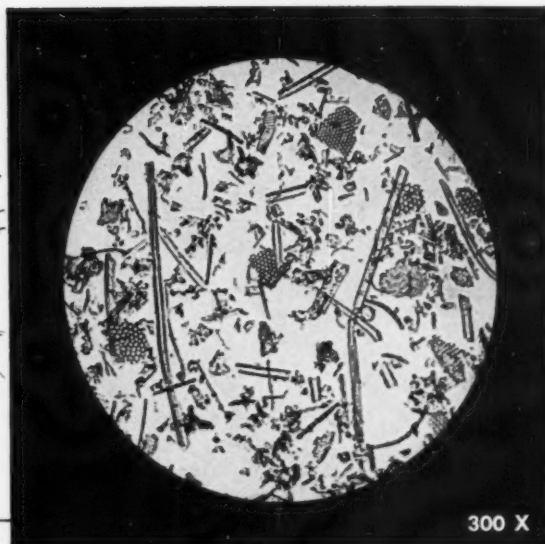
company \_\_\_\_\_

address \_\_\_\_\_

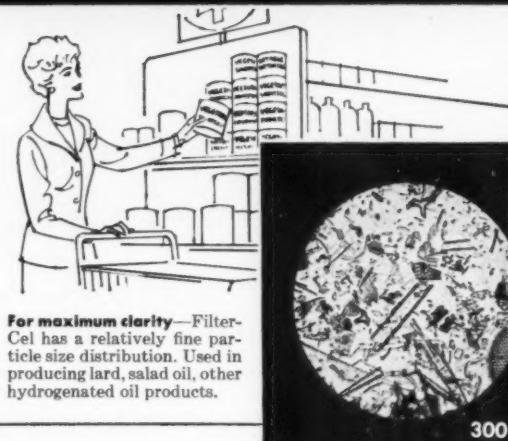
city \_\_\_\_\_ zone \_\_\_\_\_ state \_\_\_\_\_



**For flow rate plus clarity**—Hyflo Super-Cel has the right combination of large and fine particles. Heavily used in chemical processes such as caustic soda production.



**For fast flow rates**—Celite 545 has a higher proportion of coarse particles. Frequently used for clarification of resins and other viscous liquids.



**For maximum clarity**—Filter-Cel has a relatively fine particle size distribution. Used in producing lard, salad oil, other hydrogenated oil products.

**In diatomites, Johns-Manville precision processing works for you**

## Celite has the exact grade for every filtration need from fast flow rate to maximum clarity

Study samples of various filtration grades of Celite\* diatomite with the unaided eye. Rub them between your fingers. One grade looks, feels very much like another.

Then compare these grades under the microscope. Each has its own distinctive particle size distribution. Each is precision-milled to fill the most exacting filtration requirements, ranging all the way from maximum flow rate to maximum clarity.

*Celite 545*, for example, with a higher proportion of large to fine particles, is used to remove large suspended impurities at maximum flow rates. *Hyflo Super-Cel®* has a balanced particle size distribution, combines good liquid clarity and moderate flow rate. But *Filter-Cel®* has a much higher ratio of small particles, is tailored for use where high clarity outweighs flow rate.

Whatever your filtration problem—Johns-Manville can furnish the "right"

grade for the job. You have a choice of 9 intermediate grades *plus* many special grades. Each comes from the largest and purest commercially available deposit. Each is processed and graded at the same plant under the same uniform conditions.

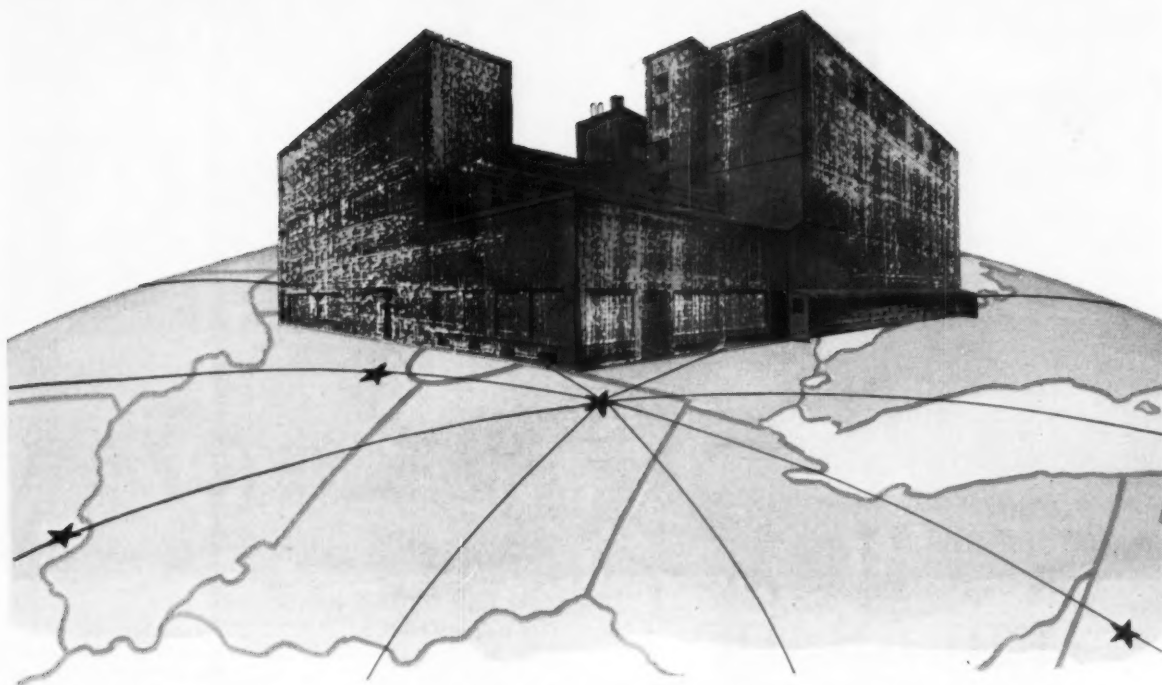
For information on specific filtration or mineral filler problems, talk to your nearby Celite engineer, or write to us. Johns-Manville, Box 14, N. Y. 16, N. Y. In Canada, Port Credit, Ont.

\*Celite is Johns-Manville's registered trademark for its diatomaceous silica products

# JOHNS-MANVILLE







## **MILES...CLOSER TO YOUR PLANT**

**new basic source of citric acid U.S.P.  
is centrally located**

Whatever you're looking for in citric acid . . . superb purity, swift service, or a reliable source . . . there are good reasons for getting better acquainted with Miles Chemical Company in the near future.

First of all, Miles citric acid U.S.P. is produced at a convenient Midwest location (Elkhart, Indiana). Rail and truck service in any direction . . . in *your* direction . . . is remarkably fast. The expanded plant capacity at Miles assures an abundant, ever-ready supply of citric acid which can be started to your receiving dock or siding within hours after your order is placed.

What's more, Miles citric acid is exceptionally pure. Years ago Miles started its own production of citric to fill its needs in producing pharmaceuticals. So Miles pioneered a unique deep fermentation process to yield a product meeting the most rigorous purity and mesh specifications.

By purchasing Miles citric acid you, too, can take advantage of this rigorous control. *We would like to talk with you about supplying your requirements and specifications.* A Miles Chemical representative can be in touch with you within a few days after we receive your inquiry. Please write.

## **Miles Chemical Company**

**division of Miles Laboratories, Inc.**

**Elkhart, Indiana**

**Telephone: COngress 4-3111**



## FRUEHAUF TRAILERS WORK PROFITABLY!

Steel, aluminum, and stainless steel Fruehauf tanks are designed and built to out-last and out-earn all others. The new Fruehauf Airlide\* Pressure Tank, for instance, is capable of unloading up to 115 barrels of aerated, powdered chemicals, cement, or barites in only 30 minutes, pumping them as high as 80 feet. Such time savings are *profitable* for chemical shippers.

Automatically welded Fruehaufs are also the longest-lasting, safest, most leak-free vessels in the business. Dollar for dollar, their specifications exceed all others for quality and value. Hundreds of chemical processors are improving distribution by shipping in bulk—and cutting costs at the same time. Investigate the many applications of Fruehaufs in *your* business.

For Forty-Six Years—  
World's Largest Builder  
of Truck-Trailers!



### FRUEHAUF TRAILER COMPANY

10948 Harper Avenue • Detroit 32, Michigan

SEND ME THE INTERESTING NEW FACTUAL REPORT  
THAT SHOWS WHY FRUEHAUF TANKS LAST LONGER.

#### AT BULK CHEMICAL HAULING JOBS

E. Brooke Matlack, Inc., of Philadelphia, recently purchased 150 of these Fruehauf Airlide\* Pressure Tanks to haul bulk cement.  
\*"Airlide"—Trademark, Fuller Company



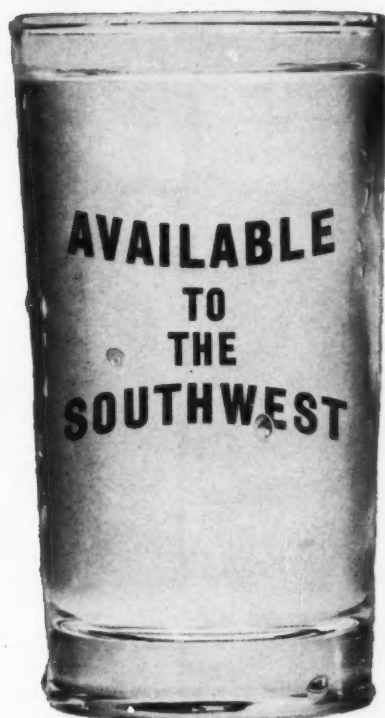
#### AT LIQUID CHEMICAL SHIPPING JOBS



#### AT PACKAGED PRODUCT TRANSPORTATION JOBS

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

# NEW FERRIC SULPHATE SUPPLY



By truck or rail...in bags or in bulk... you can now get Ferric Sulphate from Stauffer's Consolidated Chemical Division plant at Fort Worth, Texas.

For water purification Ferric Sulphate offers two major advantages:

- (1) It will form floc in water from the acid range to pH 10
- (2) It makes an exceptionally heavy floc which settles very quickly

Quality is typical of what you expect from us—THE HIGHEST—ferrous and free acid content being kept at extremely low levels.

Send for technical information.

*For areas in which alum is an excellent purifying agent we continue to supply Technical Aluminum Sulphate, A.W.W.A., liquid and dry forms, in unlimited quantities.*



## STAUFFER CHEMICAL COMPANY

380 Madison Avenue, New York 17, New York

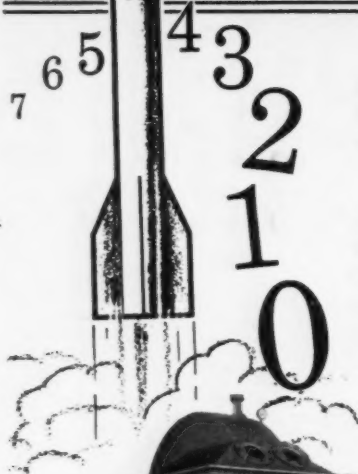
Prudential Plaza, Chicago 1, Illinois  
824 Wilshire Boulevard, Los Angeles 17, California

636 California Street, San Francisco 8, California  
P. O. Box 9716, Houston 15, Texas

CONSOLIDATED CHEMICAL INDUSTRIES DIVISION, Houston 25, Texas

STAUFFER CHEMICAL COMPANY • 380 MADISON AVENUE • NEW YORK 17, NEW YORK

# Major producers count on **DAY** equipment to process solid propellant fuels



DAY builds equipment specifically designed to meet the exacting requirements for processing solid propellant fuels. The machine types shown here have been specified by major producers of solid fuels for their safe and efficient operation, ruggedness and thorough dependability.

Investigate the many proven advantages of DAY equipment for your processing work. You'll receive every benefit that more than 70 years of experience in building a variety of processing machinery can bring, plus DAY'S matchless reputation for reliability and service. Write for detailed information on DAY equipment to meet your requirements, or call in a J. H. Day Company field engineer.

## *The* **J. H. DAY Co.**

Division of The Cleveland Automatic Machine Co.

4928 Beech Street, Cincinnati 12, Ohio

MANUFACTURERS OF QUALITY MIXING, BLENDING, SIFTING, MILLING EQUIPMENT SINCE 1887

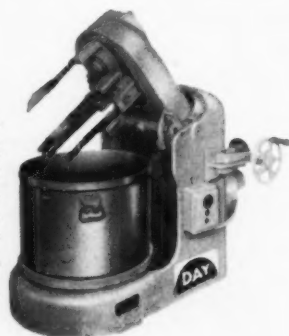


### **DAY DISPERSION MIXERS**

offer many special features for processing solid propellants: Jacketed stainless steel tank; close temperature control; many safety features; provision for vacuum mixing; equipped for remote operation. Available in a complete range of laboratory and production sizes,  $\frac{1}{4}$  - 300 gal. capacities,  $\frac{3}{4}$  to 150 h.p. drives. Write for Bulletin 1157.

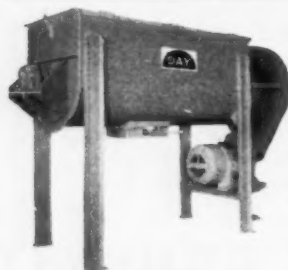
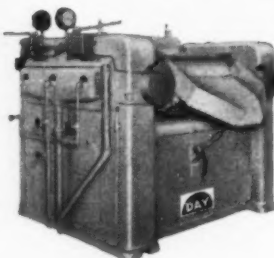
### **DAY PONY MIXERS**

twin or single motion, provide fast, thorough mixing of curing agents and high performance fuel additives. Whatever your requirements, there's a DAY Pony Mixer specifically designed to do the job. Write for Bulletin 500.



### **DAY 3-ROLL MILLS**

produce fine dispersions of fuel curing agents that were previously blended in DAY Pony Mixers. DAY Mills are built in 10" x 22" and 14" x 30" sizes for production quantities; in 5" x 12" and 4" x 8" sizes for pilot operations. Write for Bulletin 158.

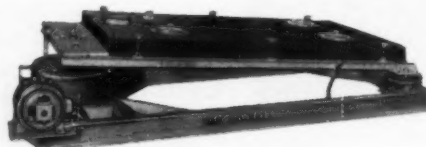


### **DAY RIBBON BLENDERS**

provide fast, pre-blending of oxidizer grain sizes prior to final dispersion mixing of the composite fuel. Built in a wide range of rugged tank sizes and designs, with various types of agitators. Write for Bulletin 800.

### **DAY RO-BALL GYRATING SCREENS**

use super-active ball cleaning principle to sift foreign materials from oxidizers and additives; to obtain selected grain sizes for burning rate control. Many models are available to provide from two to five separations, with choice of discharge designs. Write for Bulletin 957.





# Sn

## TIN CHEMICALS

are potent

CATALYSTS

Oxidation  
Halogenation  
Dehalogenation  
Hydrohalogenation  
Esterification  
Hydrogenation  
Organic Synthesis  
Inorganic Manufacture  
Condensation  
Polycondensation

### CURING:

alkyd-vinylidene  
coumarone-indene  
epoxies  
methoxy resins  
phenolics  
synthetic rubbers  
silicones

### POLYMERIZATION:

polyurethane  
olefins  
polyesters  
polyethers  
rosin  
drying oils

Making reactions really GO is a job particularly well done by tin chemicals in dozens of commercial applications. Our recently completed *patent and literature survey on catalytic applications of tin chemicals* will undoubtedly suggest many more to development men.

A wide variety of inorganic and organic tin chemicals are available from M&T. Catalytic application possibilities for organotins are greatly broadened by their solubility in many organic solvents and their volatility in vapor systems.

If you are interested in new catalysts, request our new *patent and literature survey*. M&T will then be glad to supply samples and further information based on your specific development interest.

See our insert in *Chemical Materials Catalog*

**M&T Chemicals**

METAL & THERMIT Corporation,

Sn Sb, P organometallics  
Si Ti Zr and inorganics

Rahway, N. J.

Dept. W



# EXPERIENCE

*is always* **on stream** *with* **AIR LIQUIDE**

If you're planning to build a new plant — to extend — or to rebuild... tap this rich stream of low-temperature experience! If it's a question of gas separation or recovery, Air Liquide has the efficient, economical, proven answer.

The Air Liquide stream of experience has been flowing around the world for over half a century. Gaining year by year broader and accurate know-how, it has produced hundreds of low-temperature gas separation plants all over the globe.

Whether you need a plant from an existing design or one especially designed for your particular require-

ments, Air Liquide can supply it. From the initial technical consultations, design work, manufacturing of plant and equipment, to the expert erection and start-up supervision, our widely experienced Research, Design, and Project teams smoothly coordinate with yours.

We shall be pleased to consult with you in the application of Air Liquide processes and equipment to your particular needs. Write or call us at 405 Lexington Ave., New York 17, N. Y. Telephone: YUkon 6-6544.

## AIR LIQUIDE HAVE DESIGNED AND BUILT THE FOLLOWING TYPES OF PLANTS

- Air Separation — oxygen, nitrogen, etc.
- Tonnage Oxygen and Nitrogen (Gas and Liquid)
- Rare Gases Recovery
- CO<sub>2</sub> Purification
- Methane Purification
- Natural Gas Liquefaction
- Coke-Oven Gas Separation
- Refinery Gas Separation
- Hydrogen Liquefaction
- Helium Recovery
- Pure CO<sub>2</sub> Production
- Heavy Water for Atomic Reactors

### IN CANADA:

L'Air Liquide,  
1111 Beaver Hall Hill,  
Montreal, Quebec,  
Telephone: UNiversity 6-4781



AMERICAN

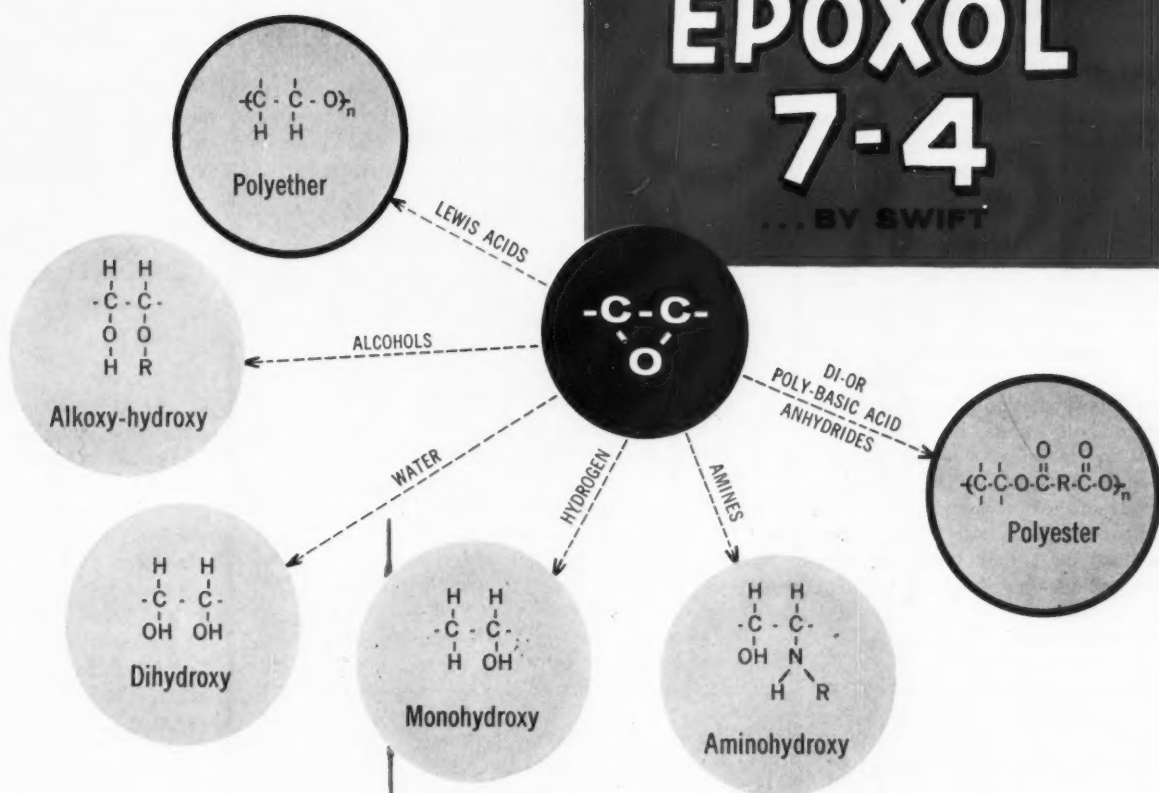
# AIR LIQUIDE

ENGINEERING & CONSTRUCTION DIVISION

OLDEST IN EXPERIENCE — NEWEST IN DESIGN

405 LEXINGTON AVE., NEW YORK 17, N.Y.

# INTRODUCING EPOXOL 7-4 ... BY SWIFT



## Specifications EPOXOL 7-4 (Swift's Epoxidized Soybean Oil)

Oxirane Oxygen.....	7.0% Min.
Iodine Value.....	2 Max.
Gardner Color.....	Less than 1
Gardner Viscosity.....	0 Max.
25°C/25°C.....	(3.4-3.7 poises)
Saponification No.....	180 Max.
Acid No.....	0.20 Max.
% Conversion to Oxirane Oxygen.....	94% Min.*
Absorptivity @ 2.9 Microns (Corrected for Background).....	0.01 Max.
Specific Gravity 25°C/25°C.....	0.990-0.995

\*Ratio of epoxidation to total oxidation  $\times 100$ .

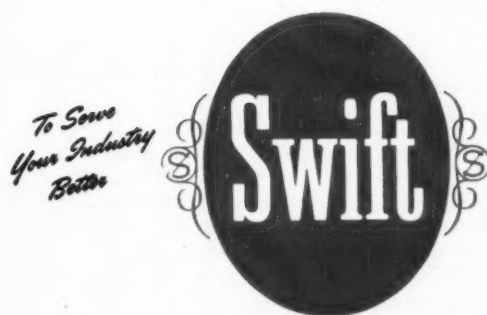
## The polyepoxide averaging over four epoxide groups

Swift's new Epoxol 7-4 is a highly reactive polyepoxide capable of polymerization to yield several types of polymers. Containing an average of over four reactive epoxide groups per molecule, Epoxol 7-4 is highly compatible with many types of resins.

It may be reacted with di- or poly-basic acids or anhydrides to form polyesters or with Lewis acid catalysts to form polyethers. Amines alone are not effective curing agents. Polymerization reactions can be carried out with Epoxol 7-4 alone, or in combination with other resins such as: polyvinyl chloride, nitrocellulose, alkyds, and bisphenol-epichlorohydrin type epoxy resins. Additional reactions of acids, alcohols, water, hydrogen and amines are also possible with Epoxol 7-4 to form the structures indicated above.

Find out *more* about this new polyepoxide with high functional purity. Return the coupon for details on a trial quantity of Swift's EPOXOL 7-4.

**SWIFT & COMPANY • Technical Products Dept.**  
1840-165th Street, Hammond, Indiana



SWIFT & COMPANY, Technical Products Dept.  
1840 165th St., Hammond, Ind.  
Please send me data on Swift's Epoxol 7-4 for (Please describe need or intended usage.)

TP-1

Company \_\_\_\_\_ (Please Print)

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Your Name and Position \_\_\_\_\_



## BEHIND THE NEWS

BEHIND THE SCENES here at **CHEMICAL WEEK** have occurred some important changes. Wallace F. Trendly, publisher of *Chemical Engineering* since 1949 and of **CHEMICAL WEEK** since its inception in '51, has been named senior vice-president of the Publications Division, McGraw-Hill Publishing Co., Inc., effective Feb. 1. In this position, Wally will have supervision over a group of McGraw-Hill publications, including the two chemical magazines.

We are proud that Wally Trendly's capable management of the two chemical publications has won him this promotion. One of his first assignments, when he joined the company in '49, was to explore the need for a weekly newsmagazine to serve management men in the chemical process industries. No business publication at that time—nor any other since—was designed to meet the requirements of both technical and nontechnical CPI management.

He also recognized the distinctly different needs of the engineer and the management man—which has permitted both magazines to grow without feeding upon each other's audience or editorial fare.

The inexorable progress of the chemical process industries is reflected in the growth of both magazines. Each of them is now too big for one publisher's divided attention.

Wally's upward move leaves a gap that will be ably filled by Robert S. Muller, who becomes publisher of **CHEMICAL WEEK**, and J. Elton Tuohig, new publisher of *Chemical Engineering*.

Bob joined **CHEMICAL WEEK** in '50. Since '53, he has served in sales management capacities for both magazines, and, since '57, has been advertising sales manager of **CHEMICAL WEEK**.

Bob's many years' business experience and acquaintance with the chemical process field, together with his keen appreciation of editorial values, assures continued improvement of **CHEMICAL WEEK** in the exciting and challenging years ahead.



EDITOR-IN-CHIEF

## LETTERS

### Toxicity Testing

TO THE EDITOR: I call your attention to the following statement in **CHEMICAL WEEK** (Jan. 2, p. 20):

"One example: it was recently found that 30 small firms were using one commercial lab to do their testing, and the lab was not carrying out the testing the way it claimed to be doing.

"Some inferior products got by as a result, though the drug firms *could hardly be held responsible for not knowing they were being duped*" (italics are mine).

I am appalled at this attitude. In the chemical industry it is a well established principle that control labs—even your own—must be cross-checked periodically. Two techniques are commonly used. One is to submit samples of known analysis and the other is to submit the same sample to more than one lab.

To fail to cross-check when human lives may be at stake constitutes criminal negligence, in my opinion.

D. A. NELSON

New Johnsonville, Tenn.

*A nice point of business ethics. How far should one carry distrust?*  
—Ed.

### Export Prices Too High?

TO THE EDITOR: Referring to your articles covering the decline of U.S. chemical exports to our main buyer, Europe, I feel that the approach to this matter by the CPI is the most unreasonable of all.

It appears that the U.S. industry cannot meet foreign competitors on the ground that was basic to U.S. expansion: competition. A lot of talking is taking place to solve this problem, since it appears that local participation in European joint ventures is not as successful as planned upon some time ago.

Diversification is one answer that might prove to be too expensive and just temporary. It will take time before the now-underdeveloped countries of Asia will be able to absorb European production. And even then the Europeans will probably be in a position to undersell our chemicals.

For quite some time, the American chemical industries have taught that

the prices accepted within the U.S. should be a basis for exports to Europe. This principle is no longer valid.

It appears to be imperative that new approaches to this problem be found and applied. The declining statistical figures prove that this is no problem to be underestimated.

CHARLES R. FUMAGALLI  
Manager, U.S.A.

Exclusive Commodities Corp.  
New York

### 'Aluminia'

TO THE EDITOR: As U.S. representative of Vereinigte Deutsche Metallwerke AG., Frankfurt/Main, we [should like to make some minor] corrections in the article on aluminum (Jan. 2, p. 12), particularly regarding the new, all-aluminum German tanker built by our German principals.

The new vessel has been christened *Aluminia*, for obvious reasons, and not *Gustav Keenig*. It happens that this size of tanker falls into the *Gustav Keenig* class.

The tanker was launched at a place called Rendsburg, which is in Holstein, and not, as you reported, "on the Rhine River at Rendeberg." You stated correctly, however, that the vessel will ultimately be used to carry oil on the Rhine.

F. EULER

Vice-President

The Ore & Chemical Corp.  
New York

## MEETINGS

**Society of the Plastics Industry**, Reinforced Plastics Division meeting, Edgewater Beach Hotel, Chicago, Feb. 2-4.

**American Society for Metals**, metals conference, Fairmont Hotel, San Francisco, Feb. 4-6.

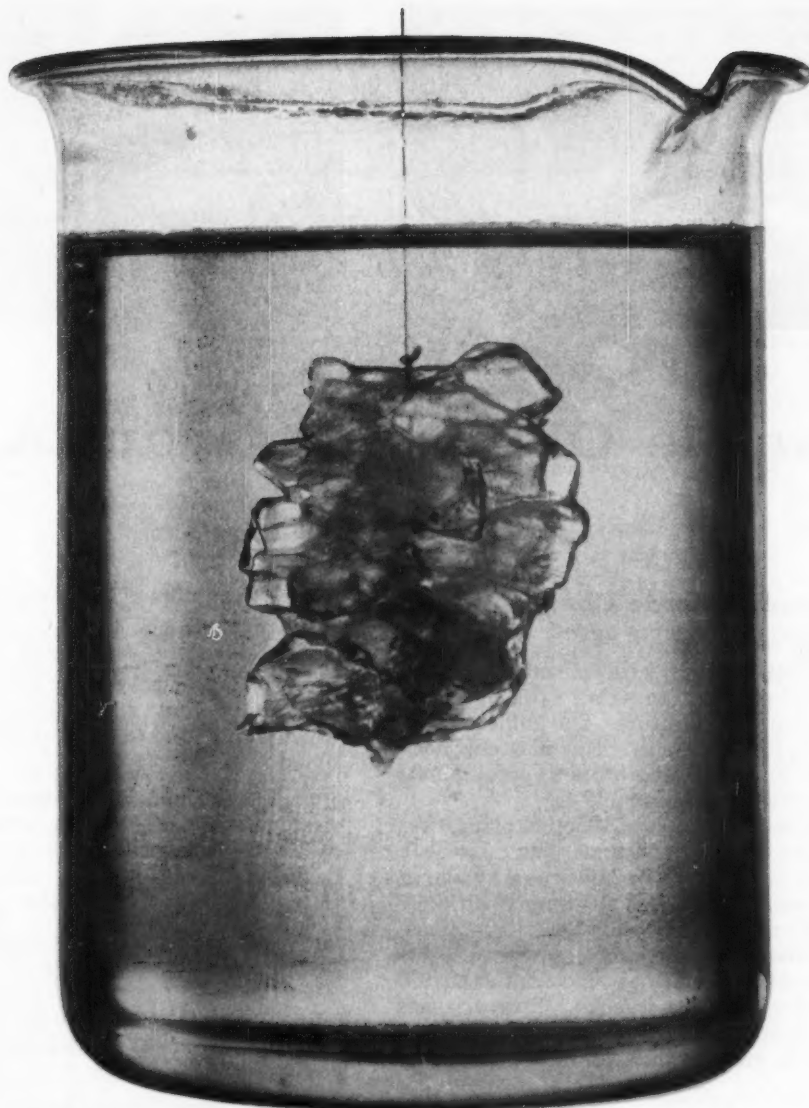
**Society of the Chemical Industry**, Perkin Medal Dinner, Waldorf-Astoria Hotel, New York, Feb. 5.

**National Chemical Credit Assn.** seventh annual meeting, Sheraton Hotel, Philadelphia, Feb. 17-19.

**American Institute of Chemical Engineers**, national meeting, Biltmore Hotel, Atlanta, Ga., Feb. 21-24.

**Technical Assn. of the Pulp and Paper Industry**, annual meeting, Commodore Hotel, New York, Feb. 22-25.





## WHAT YOU SHOULD KNOW ABOUT THE FASTEST GROWING COMPANY IN THE CHEMICAL INDUSTRY

A little over a year ago Century Chemical was just an idea. That idea was the conviction that there was a place in the industry for a new organization willing to work a little harder than most to serve its customers. To carve out such a place takes a lot of doing in an industry where "quality, service, fast delivery" is virtually a universal slogan . . . but we're doing it.

A year ago we bought Wilson Organic Chemicals, Inc., of Sayreville, N. J., in June we acquired Chemo Puro Corp. of Newark and its European subsidiary, Chemo Puro AG. These, with other acquisitions, gave us the facilities to get a fast start. Century is on its way.

It remained for *people* to test our basic premise, however. Technical people . . . salesmen . . . management—and customers. The record of our first full year of operations suggests that our idea was sound.

Starting from scratch in a highly competitive industry, our sales rate has crossed the \$10 million mark. The new Century management team has undertaken extensive modernization of production methods and facilities. Additional distributors have been appointed to provide more thorough coverage and better service to our customers. Century now produces over a hundred chemicals and intermediates, and our immediate plans call for further diversifica-

tion and expansion of our facilities.

Of course, we are mindful that our growth—past and future—depends on the goodwill of a growing number of customers. And that has to be earned. We are resolved to earn it by the quality of the things we make, by an extra measure of service . . . because that's the only way we can stay in business, let alone achieve our goal of growth. *You* will profit by that too, so write today for the latest Century product list.



**CENTURY  
CHEMICAL  
CORPORATION**

60 E. 42d St., New York 17, N. Y.



Unloading of uncoated sylvite



Now coated with Armeen T

## Versatile Chemicals from Armour

### Armour Cationic Chemicals as anti-caking agents

Until now, producers of hygroscopic materials have had to use anti-caking agents that work by preferential absorption of moisture. The difficulties in using these agents are many. But new chemicals from Armour chemical laboratories can eliminate your caking problems completely.

After exhaustive lab, pilot and actual plant tests, results indicate that Armour's cationic chemicals are superior to any anti-caking agent now available.

The anti-caking properties of Armour cationics were originally discovered during flotation applications. When the chemicals were used for flotation of sylvite, chemists found that concentrates coated with the cationics did not cake. Research has now proved that the following hygroscopic materials can also be treated successfully.

Single Salts			
Sylvite	Sodium Nitrate	Rock Salt	Urea
Ammonium Chloride	Ammonium Sulfate	Zinc Chloride	
Ammonium Metaphosphate	Ammonium Nitrate		
Granular Mixed Fertilizers			
17-7-0	14-14-14	12-12-12	10-10-10
15-8-0	12-12-0	15-8-8	

### Armacs® Armeens® Armoflos

**One pound per ton.** In contrast to the large amounts of other anti-caking agents needed for effective results, these Armour cationics work more efficiently, even though they are used in much smaller quantities. In some instances, as little as  $\frac{1}{4}$  lb. is all the Armour chemical needed. This extreme reduction in ratio of agent to product is due to the fact that Armour cationics are capable of producing a monomolecular, hydrophobic surface, instead of working by preferential absorption. Such small quantities of these Armour chemicals will also

reduce your storage space and handling problems.

**No dusting.** Armac, Armeen and Armoflo chemicals are so effective in preventing dust that some are being used exclusively for anti-dusting. This is a major improvement over other anti-caking agents, which may minimize the caking, but create excessive dust in doing so.

**Storage and handling at room temperature.** These Armour chemicals require very little in the way of special handling. Many stay fluid at 10°C or below. And, you have no concern about degradation at ambient temperatures.

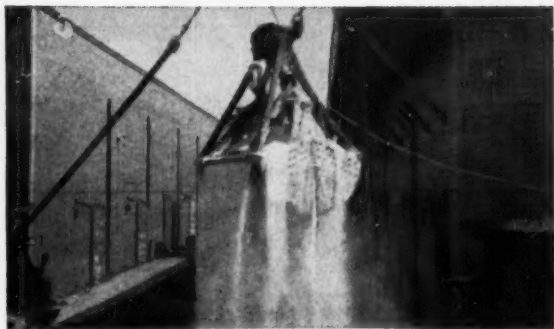
**Consistent results.** Users are especially pleased with the consistent performance of Armour cationics. There is no perceptible deviation from batch to batch. Uniform free-flow of coated materials is maintained without changing the rate of chemical addition.

**Easy application.** Armour cationic chemicals present no difficult application problems. Once the point of application is determined, the equipment for feeding the anti-caking formulation is simple, and can be constructed from low-cost materials.

### Armour Chemicals and Formulations for Anti-Caking\*

Trade Name	Product	Physical State at 25° C	M.P. °C (average)	Method of Addition	Recommended Uses
Armeen® T	Tallow Amine	Soft-solid	46°	As Received	Sylvite Sodium Nitrate Rock Salt Ammonium Sulfate
Armec® T	Tallow Amine Acetate	Pasty-solid	55°	5% Water Solution	Sylvite Sodium Nitrate Ammonium Chloride
Armoflo® 610	Formulation (Cationic)	Liquid	8°	As Received	Hygroscopic Salts and Fertilizers
Armoflo® 49	Formulation (Cationic)	Liquid	10°	As Received	Hygroscopic Salts and Fertilizers
Armoflo® 65	Formulation (Cationic)	Liquid	5°	As Received	Hygroscopic Salts and Fertilizers

\*Additional chemicals and data are covered in Armour's new anti-caking booklet offered in the coupon on this page.



... complete free-flow

**Working to improve products . . .  
develop new ones**

### Case History

Following lab and pilot tests, an actual plant test was conducted by a company that manufactures granular fertilizers. The test was conducted on a 17-7-0 fertilizer which set more readily than any other standard fertilizer produced by the company. The set, in the untreated product, was so severe that the cake could not be broken by bouncing the bagged products on the floor.



Granular fertilizer treated with Armoflo (left) and untreated (right).

New Armoflo 49, used at 1 lb. per ton, prevented caking in the product. Results of the test, conducted over a six-month period, were so successful that the manufacturer now insists all his fertilizers be treated with one of the Armour formulations.

If your company works with any hygroscopic material or any product where caking or dusting occurs, one of Armour's cationic chemicals can solve your problem. And, these Armour chemicals work more efficiently and completely for less money.

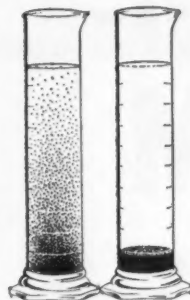
To find out more about these amazing Armour chemicals, and to receive complete information on performance tests and results, use the convenient coupon on this page.

## NEW DEVELOPMENTS FROM ARMOUR

### Selective Flocculation

Successful lab tests of Armour chemicals, confirmed by field evaluation, have now opened the way for increased efficiency and lowered costs in many flocculation operations. "Selective flocculation" results from the cationic surface activity of the Armour chemicals.

Experiments indicate that these flocculants work exceptionally well on negatively charged surfaces. In many difficult cases, these Armour flocculants are being used to clarify faster, and at much lower costs.



If flocculation is a problem in your operation, Armour will send you samples of these flocculants for your own specific tests. Use the coupon on this page to obtain your samples.



Leader in progressive fatty acid chemistry

**Armour Industrial Chemical Company**

© Division of Armour and Company

#### Send for information and samples

Please send your new Anti-Caking booklet ☐

Please send information on Armour Flocculants ☐

I would like a sample for anti-caking of \_\_\_\_\_ (material)

I would like a sample for flocculating of \_\_\_\_\_ (material)

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

CW-1-30-60

Armour Industrial Chemical Company • 110 N. Wacker Dr., Chicago 6, Ill.



versatile

# TRI SOD- IUM PHOS- PHATE CHLORINATED

it does just about everything a detergent compounder's trade asks for in a "3-way cleanser"

As a bactericide and disinfectant, Blockson's TSP Chlorinated is tops. Ditto as a bleaching-sanitizing cleanser. Encore as a deodorizing agent. TSP Chlorinated is a double salt of Trisodium Phosphate and Sodium Hypochlorite. Available chlorine content over 3.25%. Sold under private label or as an adjunct for compounded cleansers. Write for sample, technical bulletin, prices. Stocked by all Blockson jobbers.



**BLOCKSON CHEMICAL COMPANY**

Chemicals Division  
Olin Mathieson Chemical Corp.  
Joliet, Ill.



## Chemical Week

Wallace F. Traendly ..... Publisher  
Howard C. E. Johnson ..... Editor-in-Chief  
Ralph R. Schulz ..... Managing Editor  
J. Robert Warren ..... Assistant Managing Editor  
Donald P. Burke ..... Associate Editor  
Anthony J. Piombino ..... Associate Editor

### DEPARTMENTS

**Administration** ..... Cooper R. McCarthy, *editor*; F. Bryan Williams  
**Business News** ..... Homer Starr, *editor*; Bruce Bendow; Jane B. Munger  
**Engineering** ..... Kenneth C. Wilsey, *editor*; Ryle Miller  
**Markets** ..... Jorma Hyypia, *editor*; Philip A. Cavalier  
**Production** ..... Herbert C. Short, *editor*; Walter E. Andrews, Jr.  
**Research** ..... Joseph F. Kalina, *editor*; Philip A. Untersee  
**Sales** ..... Leo J. Northart, *editor*; Carl A. Hiester  
**Reports** ..... Vincent L. Marsilia, *editor*  
**Specialties** ..... Richard J. Callahan, *editor*; Marion L. Meade  
**Copy** ..... William Mullinack, *editor*; Henry S. Gordon, John Philbin  
**Art** ..... Robert T. Martinott, *director*; Richard Kluga, Forbes Linkhorn, Dolores Able  
**Buyers' Guide** ..... E. L. Sisley, *editor*; Betsy L. Emery

### REGIONAL EDITORS

**Chicago:** John M. Winton ..... **Houston:** Thomas H. Arnold  
520 N. Michigan Ave. ..... 724 Prudential Building  
**San Francisco:** Emil J. Mikity  
68 Post St.

### NATIONAL AND WORLD NEWS

**Economics** ..... Dexter M. Keezer  
**Director, News Bureaus** ..... John Wilhelm

Atlanta	B. F. Barnes	Beirut	O. M. Marashian
Chicago	Stewart Ramsey	Bonn	Morrie Helitzer
Cleveland	Arthur Zimmerman	Caracas	John Pearson
Dallas	Marvin Reid	London	John Shinn
Detroit	Donald MacDonald	Melbourne	Alicja Grobitch
Los Angeles	Kemp Anderson, Jr.	Mexico City	Peter Weaver
San Francisco	Jenness Keene	Moscow	Ernest Conine
Seattle	Ray Bloomberg	Paris	Robert E. Farrell
Washington	George B. Bryant, Jr.	Tokyo	Sol Sanders

Correspondents in 75 principal cities. Correspondents in 78 principal cities.



**Robert S. Muller** ..... Advertising Sales Manager  
**Business Department** ..... Alvin J. Babkow, manager  
**Sales Promotion Department** ..... Fred E. Lesner, manager  
**Market Research Manager** ..... Margaret J. Swikart  
**Advertising Makeup** ..... Robert L. Maier  
**Advertising Salesmen** ..... See Adv. Index, p. 92  
**Circulation Manager** ..... Paul W. Erb  
**Reprints** ..... Frances Regan

**JANUARY 30, 1960**

**Vol. 86, No. 5**

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder, EXECUTIVE EDITORIAL, CIRCULATION and ADVERTISING OFFICES: MCGRAW-HILL BUILDING, 330 West 42nd St., New York 36, N.Y. See panel below for directions regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Roth Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, President, Publications Division; Harry L. Waddell, Senior Vice-President; John R. Callahan, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Yezzerian, Vice-President and Circulation Coordinator.  
Subscriptions to Chemical Week are solicited from management men in the Chemical Process Industries in administration, production and plant operation, design and construction, research and development, sales and purchasing. Position, company connection and nature of company's business, products and approximate number of employees must be indicated on subscription application. Send to address shown in panel below. United States and United States possessions subscription rate for individuals in the field of the publication, \$3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, \$4; other Western Hemisphere countries, \$15; all others, \$25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office. Copyright 1960 by McGraw-Hill Publishing Co., Inc. All rights reserved. Unconditional Guarantee: the publisher, upon direct request from any subscriber to our New York office, agrees to refund the part of the subscription price applying to copies not yet mailed.

Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week, 330 West 42nd St., New York 36, N.Y. Subscribers should notify Fulfillment Manager promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from recent issue of Chemical Week. Please allow one month for change to become effective.

**THE BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES**





**IF NOTHING HERE WILL DO IT...**

**TAKE  
A LOOK  
AT  
TRIS  
AMINO!**



***This unique chemical may be just what you're looking for***

Tris(hydroxymethyl)aminomethane is a primary amine with three hydroxy groups. This reactive nitroparaffin derivative has great potential in chemical synthesis. In manufacture of resins, drying oils, surface-active agents. In preparation of cosmetic creams, textile specialties, cleaning compounds, etc. Evaluate Tris Amino. Mildly alkaline Tris Amino is a good buffering agent and  $\text{CO}_2$  absorbent for biological systems.

**PROPERTIES**

Chemical Formula  $(\text{CH}_2\text{OH})_3\text{CNH}_2$   
Molecular Weight 121.14  
Boiling Point,  $^\circ\text{C}$  219 to 220 at 10mm  
Melting Point,  $^\circ\text{C}$  171 to 172  
pH of 0.1M Aqueous Solution at  $20^\circ\text{C}$  10.4  
Solubility in Water at  $20^\circ\text{C}$ , g/100 ml 80

**WRITE FOR**

**SAMPLE**

**AND TECHNICAL**

**DATA—**

**FILL OUT**

**COUPON TODAY!**

Industrial Chemicals Dept.  
Commercial Solvents Corp.  
260 Madison Ave., New York 16, N. Y.

*Please send me*

- ☐ Sample of Tris Amino.  
☐ Technical Data on Tris Amino.

Name

Title

Company

Street

City  Zone  State

**INDUSTRIAL CHEMICALS DEPARTMENT**

**COMMERCIAL SOLVENTS CORPORATION**

260 MADISON AVE., NEW YORK 16, N. Y.

Atlanta • Boston • Chicago • Cincinnati • Cleveland • Detroit • Kansas City  
Los Angeles • New Orleans • Newark • New York • St. Louis • San Francisco

IN CANADA: McArthur Chemical Co. (1958) Ltd., Montreal • IN MEXICO: Consolmex, S. A., Mexico 7, D. F.



# News of the year for Epon<sup>®</sup> resin users!

- 100% Epon resin solids application
- 15 mils thick—one coat
- Conventional spray equipment

*Use your present equipment to spray 100% resin solids in applications of up to 15 mils thick on a flat or vertical surface! Sounds impossible? It was . . . until Shell Chemical developed two new Epon resin curing agents, H-1 and H-2.*

Curing agents H-1 and H-2 assure unusual working pot life while retaining all the many desirable film properties of Epon resin. Humidity does not adversely affect the performance of formulations using H-1 and H-2 . . . in fact, a small amount of moisture is actually desirable.

This "revolution in surface coating techniques" means that you can apply heavy coats of tough, durable, corrosion-resistant Epon resin as easily as you now apply a coating containing solvents. That's *really* big news!

**GET IN ON THE GROUND FLOOR** of this important new development by contacting your nearest Shell Chemical district office right now. Write or phone the one nearest you. Ask for complete information on Epon resin curing agents H-1 and H-2.

## **SHELL CHEMICAL COMPANY** PLASTICS AND RESINS DIVISION

Central District  
6054 West Touhy Avenue  
Chicago 48, Illinois

East Central District  
20575 Center Ridge Road  
Cleveland 16, Ohio

Eastern District  
42-76 Main Street  
Flushing 55, New York

Western District  
10642 Downey Avenue  
Downey, California

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Toronto



# Business Newsletter

CHEMICAL WEEK  
January 30, 1960

**Hooker Chemical Corp. plans another big expansion**—this one to boost production of caustic soda, caustic potash and chlorine at Niagara Falls, N. Y. The company will invest \$10 million in installation of Hoechst-Uhde mercury-type electrolytic cells during the next two years.

It's expected that this will be the first of a new round of expansions by caustic-chlorine producers. One reason for such expansions: anticipated growth of the fluorocarbon resins market (*CW*, Jan. 16, p. 65). Chlorine is a key ingredient in commercial fluorocarbon synthesis.

Hooker's cell installation is expected to be completed late in spring of '61—soon after the first power from the Niagara Power Project. But it's only the first of Hooker's four-step electrolytic cell expansion over the next few years. Next two steps: Hooker-type diaphragm cells; the fourth, another mercury cell addition. (The company said mercury cells were selected in the initial stage to produce caustic soda and caustic potash of "extremely low salt content." They're believed to be the first 120,000-ampere Hoechst-Uhde cells to be installed in the U.S.)

•  
**Dow will build another European plant.** Continuing its rapid-fire overseas expansion pace, Dow will erect a \$2-million styrene-butadiene latex plant at the Rotterdam terminal of its Dutch subsidiary, Nederlandsche Dow Maatschappij. The plant is due onstream in spring of '61, with capacity termed large enough to fill Europe's needs. Latex consumption for paints, textiles, paper and packaging is just reaching a volume large enough to sustain an economically scaled plant, Dow says.

•  
**Reichhold is launching a petrochemical venture** through its German subsidiary, Reichhold Chemie, at the North Sea port of Brunsbüttelkoog. Reichhold's partner in the joint venture is the independent refiner, Deutsche Erdoel (Hamburg). RCI won't reveal the nature of the products.

•  
**Bureaucratic footdragging is slowing Russian chemical gains**, U.S. government experts believe. In his statistics-studded speech to the Supreme Soviet, Premier Nikita Khrushchev left out chemical industry figures. U.S. officials report that Soviet chemical output fell short of the planned 17% gain, moved up only 10%. This year's goal is another 10% hike, far smaller than the annual gains the industry will have to register in the next few years if it is to meet the seven-year-plan goal of a 300% boost in chemical output.

**Lagging equipment production is one reason for the slowdown.** Another seems to be the unwillingness of plant managers to spend time installing more-efficient equipment. They seem to shrink from any plant shutdowns that might mean failure to meet short-term production quotas.

## Business Newsletter

(Continued)

**Chemical sales and earnings are pointing to new peaks in '60,** just as figures start coming in on last year's record performances.

In '60, producers of chemicals and allied products will boost their sales 10% to \$27.5 billion, and will push after-tax earnings up 15%, to \$2.25 billion, according to President Norman Alexander of Sun Chemical Corp. in a forecast to members of the National Industrial Conference Board last Friday.

On the same day, various chemical companies were adding fourth-quarter '59 data to their nine-month results and coming up with totals that generally show the steel strike wasn't too rough on CPI business.

Allied Chemical's fourth-quarter net income was down 4%, partly because of the strike and partly because of a temporary increase in depreciation; but for last year as a whole, sales were up 13%, to \$719.7 million, and earnings were up 46.1%, to \$50 million.

Diamond Alkali elevated sales 20.8%, to \$137.9 million, and hoisted earnings 75%, to \$11.3 million. Hooker Chemical also posted new records: sales up 19.3%, to \$149.8 million, and earnings up 25.9%, to \$13.4 million—both for the fiscal year ended Nov. 30. For Rayonier, '59 was the third best year to date, with sales up 17.3%, to \$129.5 million, and earnings up 271%, to \$13.4 million.

Catalin Corp. increased its sales 7.1%, to \$22.3 million; but—largely because of a nonrecurring loss on sale of obsolete equipment—net income was down 58%, to \$74,511.

**Trona mining, or irrigation farming**—which should get priority? The question reflects the latest hitch encountered in the trona (soda ash) scramble in the Green River, Wyo., area (*CW*, Aug. 29, '59, p. 40). Stauffer Chemical Co. has discovered extensive deposits of trona underlying the southern end of the Seedskadee Reclamation Project. It has projected a \$20-million plant for the area—which would put it on a par with Intermountain Chemical Co.'s similar-size unit now in operation. But a mining problem will arise if the Seedskadee land is developed for farming by irrigation, as originally planned.

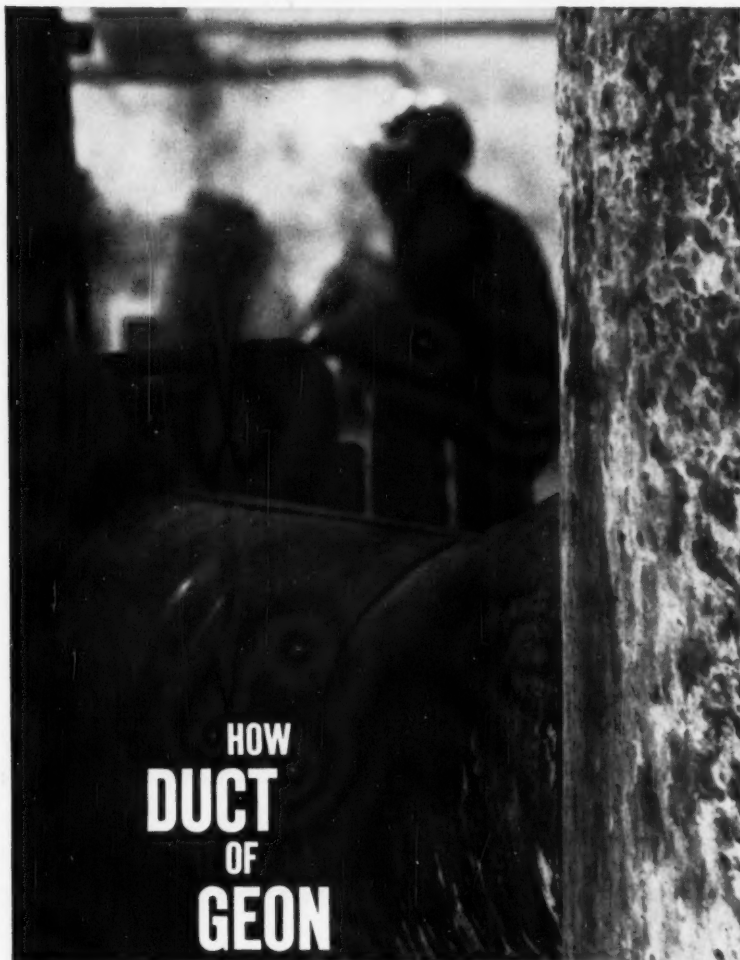
Discussions are now under way, with Stauffer reporting it is "actively pursuing all aspects of its trona project in the expectation that the conflict can be resolved."

**Footnote in the feuding over water fluoridation:** one of the world's most scientifically sophisticated communities last week began using fluorinated drinking water. The Wilmington (Del.) Water Dept.—serving hundreds of scientists, engineers and technically trained executives of the three big chemical companies headquartered there, plus their families—reports that in the first week of fluoridation no one seemed to notice the change.

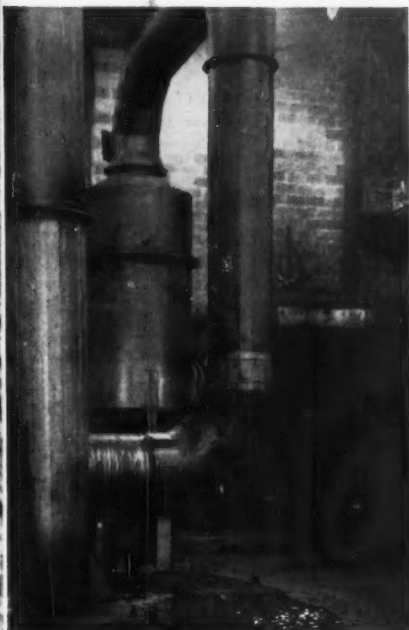


**Another new development using**

# **B.F. Goodrich Chemical** raw materials



*The large duct shown here was fabricated of Geon vinyl by Colonial Plastics Mfg. Co. through their distributor, Gould-Kramer, Inc., Cleveland, Ohio. B.F. Goodrich Chemical Company supplied the Geon vinyl.*



## **CONQUERS CORROSION IN CHLORINATION ROOM**

A tougher corrosion problem than this one would be hard to find. That's why all the large round duct you see is fabricated from rigid sheet made of Geon vinyl.

This room is where spent gases are carried from chlorinating operations to storage tanks. The atmosphere is such that personnel must wear goggles and face masks at all times. Corrosion would make short work of most ductwork or pipe.

But Geon is unaffected by acids, oils or many hydrocarbon chemicals. It is easy to fabricate, light in weight,

and simple to install. Duct, pipe—even complete fans and valves—made of Geon are solving corrosion problems throughout industry.

For more information on products made of Geon vinyl—or on this versatile material itself—write Dept. GH-1, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



**B.F. Goodrich Chemical Company**  
a division of The B.F. Goodrich Company



GEON vinyls • HYCAR rubber and latex • GOOD-RITE chemicals and plasticizers

# It's your move!



**PROBLEM:** You (X) moved first in this game of ticktacktoe. Your opponent responded as shown. Now, one play will give you an unstoppable win. What is it?

**T**HE NEW CHLORINE-CAUSTIC FACILITY at our Geismar Works immediately south of Baton Rouge, Louisiana, positions Wyandotte as a multi-plant producer of these two key chemicals. (Geismar is also the home of our second ethylene glycol plant.)

**It's your move now.** You can build on or near this strategically located Southern site for "over-the-fence" supply. You can benefit from the inland waterways, railways, and highways that link Wyandotte plants with four-fifths of the productive capacity of the U.S. and Canada. You may even find it profitable to ship *your* product to *us* for custom ethoxylation at our Wyandotte plant.

See the possibilities? For information . . . or a get-together . . . write us, today. *Wyandotte Chemicals Corporation, Dept. 701-W, Wyandotte, Michigan. Offices in principal cities.*

## ANSWER

1	2	3
4	5	6
7	8	9

Luck is with you. The first move by X was a poor one\*, but O's move was even worse. By seizing position No. 9, you can now force your opponent to take No. 7, leaving No. 5 open. Move in here, and you threaten with two separate wins . . . No. 1 or No. 2. Your opponent cannot stop both!

\*Your chances in this game are much better if you open by seizing one of the corners. Your opponent can then avoid being trapped only by taking the center position. Center and side openings present a wealth of traps.



## Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION  
PACING PROGRESS WITH CREATIVE CHEMISTRY

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE • MURIATIC ACID • HYDROGEN • DRY ICE GLYCOLS • SYNTHETIC DETERGENTS • SODIUM CMC • ETHYLENE OXIDE • ETHYLENE DICHLORIDE • POLYETHYLENE GLYCOLS • PROPYLENE OXIDE • PROPYLENE DICHLORIDE • POLYPROPYLENE GLYCOLS • DICHLORODIMETHYLHYDANTOIN • CHLORINATED SOLVENTS • OTHER ORGANIC AND INORGANIC CHEMICALS

## Propylene Pressure

High-pressure polypropylene may well be the next major development in the plastics industry.

You can, however, ignore reports that Badische in Germany has already developed such a process. The word being bruited about the industry last week was that Badische had completed development work, was getting ready to make an announcement in the spring. The story generated a lot of interest—while it lasted. Badische, of course, has a high-pressure polyethylene process capable of turning out a product of intermediate density. This has been licensed to Koppers and almost certainly to Monsanto (although Monsanto won't comment on the subject). The theory, then, was that Badische had extended this process to polypropylene.

But in a statement to **CHEMICAL WEEK**, the German firm scotched the rumor with a flat and emphatic denial.

**Problems Galore:** That doesn't rule out the possibility, however, that someone may find a way to make polypropylene by a high-pressure process. Right now, several firms (including Du Pont, Carbide and ICI) are believed to be working on this.

The difficulty with synthesizing polypropylene in a high-pressure system is that the methyl group takes part in the reaction, forming a cross-linked mass. The trick is to find a way of keeping the methyl group from participating.

A big economic incentive for high-pressure polypropylene is advanced by one of the country's top polymer chemists: "Polypropylene seems destined to become a major plastic. High-pressure polyethylene plants now in place are many times bigger than those planned for polypropylene. If some of this capacity could be converted to polypropylene, producers would be able to make large quantities of polypropylene on short notice with little additional capital investment."

Thus, while the problems in developing a high-pressure polypropylene process are big, so is the incentive.



WIDE WORLD

In series of meetings, Dillon states case for U.S. exporters.

## Green Light for U.S. Goods

In Paris next month, representatives of 20 Atlantic nations—including the U.S.—will examine the problem of the "Six and Seven"—the two European trade blocs whose deepening split is threatening to culminate in a divided Europe. At stake: future U.S. chemical exports.

The meeting was arranged at the recent 13-nation conference, which revolved around U.S. Under Secretary of State Douglas Dillon's efforts to force European trade problems out of the relatively narrow European sphere and into a worldwide setting—one in which U.S. interests will be protected.

**Successful Sally:** This month's conference was not the first time Dillon has sallied forth in defense of U.S. exports. At the Tokyo GATT conference last October, he vigorously advocated a lowering of discriminatory barriers against shipments from the U.S. (*CW*, Oct. 31, '59, p. 24).

Since then, virtually all limitations on U.S. chemical imports have been removed, or will soon be removed.

France, for example, has ended

discriminations against U.S. exports of carbon black, monosodium glutamate, Terramycin, sensitized plates and film, styrene polymers, polymerized chloroacetate, medicines and vaccines, synthetic fibers, photographic film and paper. Denmark has eased restrictions on toiletries and cosmetics, photographic film and plastics. Italy has lifted restrictions on paints and varnishes, photographic chemicals, and man-made fibers.

The other OEEC members have also removed or promised to remove nearly all remaining restrictions. The United Kingdom, Australia, and the other British Commonwealth partners now have practically no discrimination against U.S. chemical imports.

Few chemical export men expect these moves to result in a profound revolution in exports. Many of the moves are little more than window-dressing. For most countries—France is a good example—formidable barriers against imports remain.

**Still Optimistic:** But the experts do expect some good to come out of the



liberalizations. Allied's international market research director, Bernard Kornhaber, points to the recent increase in Allied's exports to Australia as an example of what removal of discrimination can mean. "Now at least we have a fighting chance," he says. "Now it comes down to a question of price."

A Monsanto spokesman, also bullish on Australia, sees opportunities for promoting the company's specialty items, reaching importers who until now could not think of the U.S. as a source of supply.

Even without the liberalization moves, the short-term outlook for exports is bright. They were up more than 7% during the first 11 months of '59, over the corresponding period in '58, and they are expected to rise at least 5% this year. James Baird, head of Baird Chemical Industries, attributes almost the entire rise to the increase in European industrial activity. And Fallek Products Co.'s President Fred Fallek declares that European producers are already pressing against capacity, leaving the way open for U.S. exports for at least another year.

But for the long run, a continuing increase in U.S. exports may rest heavily on the final outcome of questions that the experts will begin pondering next month in Paris.

## Thiokol: Three to Grow

Thiokol Chemical Corp. (Trenton, N.J.) will show uninterrupted growth through at least the next three years, predicts company President Joseph Crosby. His forecast is based, in part, on confidence that Thiokol will "definitely get the contract for the first stage of the Minuteman" — which would then be Thiokol's major project for 1962.

Moreover, Crosby tells *CHEMICAL WEEK*, Thiokol is competing for the second stage.

But future growth, Crosby concedes, will probably not match the hectic pace of the past two years.

Thiokol already has responsibility of developing and producing the solid-fuel propulsion system of the 400-mile-range Pershing; it has just received a \$985,585 contract to prepare Pershing motor production facilities at the Longhorn Ordnance plant (Marshall, Tex.).

**Facility Contract Set:** Thiokol now has an architectural and engineering contract for the Minuteman production facility (to be at Brigham City, Utah). The first-stage contract will probably be awarded this year, Crosby says.

Nearly 90% of Thiokol's business now is with the government. Because government programs are subject to sudden change, Thiokol's chief executive won't predict 1960 sales and earnings. But he says he doesn't expect this year's volume to show a gain proportionate to the 1959 increase over '58 levels.

Estimated '59 sales are now set at \$175 million, compared with \$88.9 million in '58. And '59 earnings are tabbed at more than \$5.5 million—or \$1.25/share, compared with 68¢/share '58 earnings (adjusted for last April's three-for-one split).

**Damper on Production:** A production slowdown this year is expected as a result of the recent explosion in the Longhorn Division's solid-fuel mixing unit — termed the "life-blood" of Thiokol's operations in Texas. Damage was estimated at more than \$1 million, and one company executive has set April as the earliest date the company could be turning out solid-fuel rocket motors at its regular rate.

But H. R. Ferguson, company vice-president, says curtailment of production in the Texas unit could be compensated for by operations of other solid-propellant divisions in Alabama, Maryland and Utah.

Crosby is as bullish on technical achievements as he is on business. "A 10-million-lb.-thrust engine for a man-and-equipment moon shot within two years is well within the present state of art and capability of the company," he maintains.

In answer to a *CW* question as to whether solid-fuel engine development in the future might be neglected in light of the government's decision to go full speed on liquid hydrogen-fueled Saturn (*CW*, Jan. 23, p. 25), Crosby said he doesn't expect solids to take a back seat.

"Both solids and liquids will have a place in rocket programs," he holds. Solids are the best rocket launchers; but liquid-fueled stages could be cut in when the rocket's in space, the burning rate controlled to guide the rocket to its destination.

## Cash-In on Chemicals

**More petrochemical projects**—upgrading the intermediates now produced—are in store for Sunray Mid-Continent Oil Co. (Tulsa, Okla.). Company President Paul Taliaferro is banking on such projects to help keep profits growing despite limitations on oil industry growth.

Currently under consideration for the company's recently acquired Sun-tide refinery at Corpus Christi, Tex.: a venture that would use benzene and toluene from that refinery's Udex unit to produce chemicals for the rubber and synthetic fiber industries.

Just last week, Sunray decided to install a \$1-million Udex unit to produce benzene and toluene at its Tulsa refinery (*CW Business Newsletter*, Jan. 23). Also under construction at the Tulsa plant: a \$7-million dewaxing unit to replace present paraffin wax facilities. Other recent expansions: \$12 million worth of new construction at the refineries in Tulsa and Duncan, Okla.; and addition of a delayed coking unit at the Corpus Christi plant.

The Udex to be installed at Tulsa, Taliaferro said last week, will use a petroleum feedstock that up to now has gone into gasoline production. Benzene output from this unit, he went on, has already been contracted for "on a favorable basis for a five-year period." The new dewaxing facility, he said, will improve lubricant quality, increase production of fully refined wax, and enable Sunray to begin producing microcrystalline wax. Projected output of microcrystalline wax, he added, would account for more than 20% of current U.S. production.

The Corpus Christi refinery—which turns out xylene and tetramer as well as benzene and toluene—is highly automated, having been built in '54, Taliaferro said.

So far, petrochemicals yield relatively small income for Sunray. The company's total sales in '59 are estimated at \$450 million; and a Sunray executive told *CHEMICAL WEEK* that petrochemical sales this year would probably exceed \$5 million. But the petrochemical portion of sales seems sure to increase as much of the company's research work, and a considerable share of its \$5-6-million/year capital outlays, are channeled into projects designed to boost earnings without increasing crude throughput.



## LAWMAKERS AT WORK — ON BILLS THAT COULD BITE

Representative measures of CPI significance being considered by state legislatures this year

### Air pollution

- In New Jersey, a bill to protect company trade secrets during pollution investigations.
- In Pennsylvania, a bill to set up local and state control boards.

### Drugs

- In New York, a bill to investigate pricing of "wonder drugs."

### Engineers

- In West Virginia, a bill to levy a 1% gross income tax on licensed professionals.

### Industrial development

- In Kentucky, a bill to provide loan funds for small towns trying to attract industry.

### Local taxes

- In Maryland, a bill to permit Baltimore to tax local earnings.
- In Virginia, a bill to permit Richmond to tax local payrolls.

### Minimum wage

- In New York, a bill to boost state minimum wage from \$1 to \$1.25/hour.

### Pesticides

- In New York, a bill to regulate use of commercial poisons.

### Tax assessment

- In New Jersey, bills to set assessment rates on plants, equipment and inventories.

### Unemployment and disability compensation

- In New Jersey and New York, bills to increase benefits and tighten administration.

## State Money Hunt Menaces Plant Profits

This week, lawmakers in a dozen or more states with large concentrations of CPI plants are framing, debating and revising measures that can directly tap operating profits. Results of their deliberations could change the business climate in many areas, sharply shift the odds on selection of sites for new plants.

In many states, the legislators' prime problem is money. In New Jersey, for example, the legislature will be considering various tax formulas on assessment ratios for real estate, equipment and inventories. Whatever formula is enacted could be a big factor in profitability of chemical plants, which generally rank high in amount of capital invested in equipment per employee.

Confronted with legislative propos-

als that could make or break a given plant project, CPI executives—gradually and reluctantly — are moving toward more active roles in state and local politics.

In Texas, this move is relatively well advanced (*CW*, Dec. 26, '59, p. 21). In Illinois, the Drug and Chemical Industries Activities Committee may decide within the next month on a proposal to provide a legislative information service for member companies. In New Jersey, a group of chemical company men helped draft a bill that would protect a company's trade secrets during an air pollution investigation.

And various chemical companies have programs to interest their management men in politics; one medium-size chemical firm says 350 of its

employees have taken the political action course offered by the Chamber of Commerce of the U.S. The company pays all costs, gives time off from work so employees can attend class sessions.

This kind of program can run into money, but the stakes are high.

State legislatures in Alaska, Arizona, Colorado, Georgia, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Nevada, New Jersey, New York, Pennsylvania, Rhode Island, South Carolina and Virginia are holding regular sessions this year. Budgetary, special and extended sessions are scheduled in California, Delaware, Hawaii, Maine, Vermont and West Virginia; and it's likely that special sessions may be called in several other states soon.

# Euromart Paces OEEC Spurt in Chemicals

As western Europe's chemical industry steams ahead despite continuing uncertainty about the final pattern of trade relations between its two trading blocs, two major trends are clear. The industry is growing fastest in the six-nation European Economic Community (the "Common Market"); and, for both the Common Market and western Europe as a whole, the strongest surge is in petrochemicals.

These trends were already apparent in last year's chemical industry report from the Organization for European Economic Cooperation (*CW*, Feb. 7, '59, p. 20). They are even clearer in OEEC's new report, covering chemical industry developments in the 18-member organization for 1958 and, for some general aspects, the first half of '59.

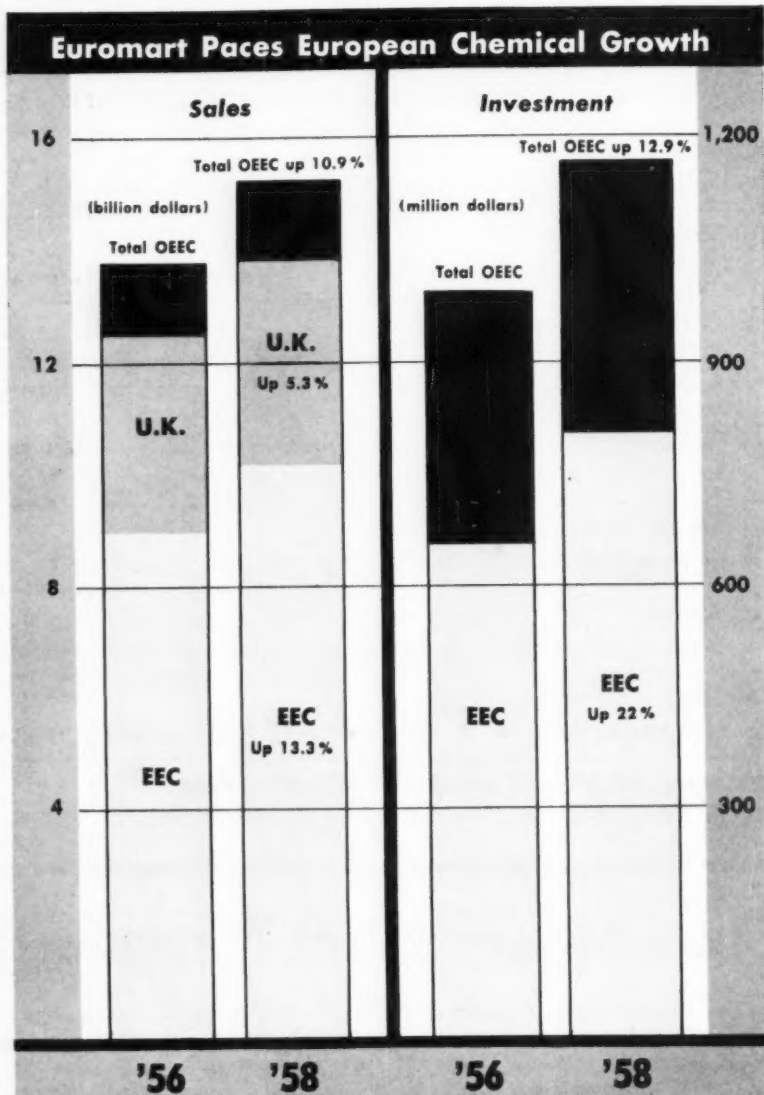
While U.S. chemical production slumped in '58, total OEEC output rose by 6%—about half the increase rate achieved in '57. In the first half of '59, the growth rate was 9%. For the Common Market alone, '58 output exceeded the over-all rate, rising 8%.

Chemical turnover (sales) was up 10.9% in the OEEC, 13.3% in the Common Market. And investment in all 18 nations increased 12.9%, while the rise was almost twice as high in the EEC—22%. Petroleum chemicals production for all the OEEC nations rose 29%.

**Only Slight Slump:** There are several reasons why European chemical production didn't follow the U.S. pattern in '58. The economic recession, for one, was milder in Europe than in the U.S. More significant, the European chemical industry's health has been buoyed by economic trends that are fast making European life similar to that in the luxury-minded U.S.

Plastics is the outstanding example. With demand up by 24%, European producers, continuing their raw material switch from coal to petroleum, boosted output 15% in '58, brought the four-year rise to 66%. Sales in '58 totaled 1.6 million tons.

France made the best showing in '58, with chemical production up 14%. It rose 7% in Germany and Italy. But chemical output declined 6% in Belgium-Luxembourg, and 1% in the United Kingdom.



## Production Profile for Six European Countries\*

	1958 (million dollars)	Increase from '54
Dyestuffs	522	14%
Tanning extracts and synthetic materials	21	31%
Paints, varnishes, related products	965	33%
Medicinal and pharmaceutical products	1,330	44%
Soap and detergents	855	32%
Manufactured fertilizers	1,267	31%
Explosives	282	20%
Plastic materials	1,017	66%

\*Belgium, Denmark, France, Germany, Norway, United Kingdom.

## COMPANIES

**The Firestone Tire & Rubber Co.** (Akron, O.) stockholders have approved a three-for-one stock split—third split within the past nine years. Effective date: on or about Jan. 25. This will increase the number of authorized common shares from 12 million (par value, \$6.25/share) to 36 million (no par value). Also approved: enlargement of the board of directors from nine to 11 members.

**Peabody Coal Co.** (Chicago) and Curtiss-Wright Corp. (New York) have formed Peabody Wright Corp. (St. Louis) to build and operate a plant producing chemical coke, gases, low-temperature coal tars and coal-based paving binder, using combined processes of both firms.

**Telecomputing Corp.** (Los Angeles) has offered to acquire all outstanding stock of Narmco Industries, Inc. (San Diego, Calif.), manufacturer of resins, coatings and adhesives. The acquisition is expected to be completed in February, making Narmco a wholly owned subsidiary of Telecomputing. Narmco sales currently are more than \$12 million.

**Koppers Co., Inc.** (Pittsburgh), has purchased Knight Paving Products, Inc. (Rochester, N.Y.), which now will be the Knight Paving Products Dept. of Koppers Tar Products Division.

## EXPANSION

**Polyethylene:** Dow Chemical has begun new facilities at Freeport, Tex., to increase conventional and intermediate-density polyethylene resin production 67% by late '61. Plant capacity is now estimated at 50 million lbs./year (*CW Ethylene Report*, May 9, '59). Its two other polyethylene facilities—Dow's Louisiana Division (Plaquemine, La.) and Saginaw Bay Division (Bay City, Mich.)—are expected onstream this year. To be produced at Bay City: high-density resin under a Ziegler process.

**Petroleum Products:** Regent Refining of Canada, subsidiary of Texaco Canada, will construct a 4,700-bbbl./day catalytic reforming unit at its Port Cret, Ont., refinery. Estimated costs: \$1.5 million. Scheduled onstream in '60, it will replace a 2,000-bbbl./day unit.

**Polyethylene:** Semet-Solvay Division of Allied Chemical will expand its Tonawanda, N.Y., polyethylene plant capacity 10-20% this year above the 30-million-lbs./year capacity attained in '59.

**Packaging Film:** Milprint, Inc. (Milwaukee), will expand and consolidate both East and West Coast plants

this year at a cost of \$800,000. Plants at Christiana, Pa., and Los Angeles will be closed; Downingtown, Pa., and South San Francisco plants will be enlarged.

**Packaging Machinery:** Cryovac Equipment Division of W. R. Grace & Co. is building a plant at Woburn, Mass., for production of machinery expected to open new Cryovac applications—now centered largely in food packaging. Cryovac's transfer from Cambridge, Mass., to the new plant on property formerly owned by Calidyne Co. (Winchester, Mass.) is slated for early June.

## FOREIGN

**Polyester Fiber/England:** Imperial Chemical Industries has sold to Czechoslovakia the right to use its Terylene polyester fiber process, reportedly for \$616,000. Similar arrangements were made with Poland last year. Neither country will use the name Terylene for its product. Two-year negotiations on the use of Terylene patents with the Soviet Union are still pending.

**Superphosphates/Morocco:** Sutrima, a company formed by the Moroccan government, and several European buyers of phosphates will build a \$13-million (200,000-tons/year) plant at the southern port of Safi, linked by rail with phosphate deposits at Louis Gentil. Also planned: subsidiary plants for sulfuric and phosphoric acid.

**Paints and Varnishes/Italy:** Montecatini (Milan) has begun construction of a new industrial complex at Codogno. Initially, paints and varnishes will be produced; later, petrochemicals. Planned paint and varnish output: 50,000-70,000 tons/year.

**Drugs/Brazil:** Vick Chemical Co. (New York) has acquired the Brazilian pharmaceutical firm of Laboratorios Moura Brasil-Orlando Rangel. The company's ethical drugs will be sold through the Brazilian company, including the principal research specialties of Vick's ethical drug subsidiaries: Wm. S. Merrell Co. (Cincinnati), National Drug Co. (Philadelphia) and Walker Laboratories (Mount Vernon, N.Y.).

**Para-Xylene/France:** Oronite Chemical Co. (San Francisco) will produce *p*-xylene in France in a joint venture "prompted by a rapidly expanding market abroad for synthetic fibers, particularly in France." A multimillion-dollar plant—scheduled for completion late this year—will be built at Donges, on the Loire River near St. Nazaire. The new company being formed to build and operate the plant will be known as Societe Californie-Atlantique; it's being organized by principal stockholders of Antar Petroles de l'Atlantique and Societe Progil.



# 20,000 gallons of acetic acid ride in one aluminum package!



*One of 50 GATX 20,000 gallon aluminum tank cars for glacial acetic acid service, delivered to Celanese Chemical Company by General American.*

## NEW GATX TANK CARS HAUL TWICE AS MUCH ACETIC FOR CELANESE!

Celanese Chemical Company produces millions of gallons of acetic acid—needs aluminum tank cars to transport it. Such cars, in standard 10,000 gallon size, have been supplied for many years by General American. Today a newly designed GATX car makes it possible to haul double the old quantity in one car.

Savings in freight rates, larger cargo capacity, much lighter weight per gallon of capacity, and greater product versatility are among the

new GATX car's advantages. In addition to acetic acid, the 20,000 gallon GATX aluminum car can carry nitrogen fertilizer solutions, formaldehyde, hydrogen peroxide, fatty acids, acrylonitrile, nylon salts and many others.

General American builds, leases and sells a wide variety of special purpose cars. Tell us about your requirements. If there is no car exactly suited to your needs, General American can design and build one.

**GENERAL AMERICAN TRANSPORTATION CORPORATION**

135 South LaSalle St. • Chicago 3, Illinois • Offices in principal cities

*You'll find it pays to plan with General American!*





# Washington Newsletter

CHEMICAL WEEK  
January 30, 1960

**Criticism of the compulsory licensing provisions** of cancer research contracts is contained in a report by the Senate Patents Subcommittee.

Medical research contracts ordinarily provide that all results and patents shall be freely available. An exception is made for the major drug companies doing cancer research. They retain title to patents developed under government contracts, subject to "complex and untried provisions" for compulsory licensing, if the Surgeon General feels it is necessary.

Subcommittee Chairman Joseph O'Mahoney (D., Wyo.) said that if compulsory licensing is to be substituted for the usual policy, then the "standards under which such licensing may occur should be established by Congress rather than by contracting officials." He believes present policies are working "reasonably well."

**Lower rates for barge-plus-rail shipments** will flow from a new Supreme Court decision.

The high court upheld a lower-court ruling that railroads must give inland waterway-originated shipments the same rates as charged for rail-originated traffic.

The issue stems from the fact that railroads charge more for the final rail movement of traffic that has been carried part of the way by barge than they charge for goods shipped entirely by rail.

For example, the cost of shipping fertilizer from Kansas City to Chattanooga is 60¢/100 lbs. by rail, but is only 22½¢ by barge. However, if the shipment is destined for an inland city such as Orangeburg, S. C., and if it had moved partly by barge, the final rail leg cost 54¢/100 lbs.; if the shipment had previously moved by rail, the charge for the final leg is only 16¢. Thus, the total freight charge from Kansas City to Orangeburg amounts to 76½¢/100 lbs. for a barge-rail shipment, compared with 76¢ for an all-rail shipment.

Barge operators charge that the railroads, through discriminatory rate-setting on the final rail leg of the shipment, were in effect destroying the 37½¢ rate advantage of water transportation from Kansas City to Chattanooga. This, the waterway operators argue, runs counter to the National Transportation Act—designed to protect shippers' inherent advantage of lower-cost waterway transportation.

**More time extensions for proving safety of food additives** will be granted in the weeks ahead as the March 6 deadline approaches. The first to get a year's extension are carbon black and charcoal (*see p. 38*).

Nearly 500 additives are already on the exempt list. A third list of 150 buffers, neutralizers, anticaking agents and other ingredients

## Washington Newsletter

(Continued)

will be publicized shortly in addition to the 150 flavorings and 182 seasonings and other agents on the first two lists. The total is about half of the food additives in use, including most of the common ones.

Quinine (for gin and tonic), orris root and wintergreen won't be exempted until further data is available. But FDA says there should be no difficulty in setting levels of safe usage for these.

•  
**Federal loans to cities for building saline-water conversion plants** are getting attention in Congress. A bill sponsored by two Republicans, Sen. Gordon Allott (Colo.) and Rep. John Rhodes (Ariz.) has drawn a number of cosigners, mostly Westerners. While it won't be passed this year, it is being pushed. The Dept. of the Interior is warm to the idea but the Budget Bureau will probably suggest holding off until techniques are improved through the current demonstration plant construction program. The bill would have the government grant 40-year loans, to be paid back with interest.

•  
**A register covering 90% of the nation's scientists** is called for in a report by the National Science Foundation. It would double the present file and keep it up to date. The existing one is not. The idea of a register is to provide ready lists of scientists in all specialties in the event of a national emergency.

During peacetime, the register would provide information on numbers and types of scientists, their deployment, where shortages are developing, what training is needed, etc. Membership lists of professional societies would be supplemented with names obtained in the upcoming 1960 census.

The register would not be open to industry trying to find specialists. The feeling is that if it were, companies would not allow their men to register, for fear another company would try to recruit them.

•  
**A drive to attract businessmen into embassy posts abroad** this year will soon be divulged by the State and Commerce departments. The idea is to use experienced American businessmen to stimulate U.S. trade.

There are now about 113 commercial attaches in diplomatic posts. This number would be tripled, with the bulk coming from private industry. Salaries would be about \$15,000, plus allowances, for a four-year stint.

Many details are yet to be settled, but officials hope to launch the program in March and have most of the posts filled before the end of the year. One big problem: how to attract men in their middle years who don't want to be away from their companies that long. Emphasis may be on getting older men near retirement age who may be willing to take a pay cut in exchange for an exciting assignment.



Supply unlimited.

# Citric Acid

## Sugar Cane . . .

and from it . . .

cane blackstrap molasses . . .  
the most basic carbohydrate  
source, now expanded  
to new chemical horizons  
through BZURA  
advanced fermentation  
technology to bring you  
Citric Acid, U.S.P.

. . . in unlimited supply.

Write today  
for informative literature  
which describes our company  
and our products.

It will help us become  
better acquainted.



**BZURA CHEMICAL COMPANY INC.**

Keyport, New Jersey / Plant: Fieldsboro, New Jersey



*"Gotta check everything in making top-grade fatty acids!"*

Fatty acids that meet a user's demanding specifications shipment after shipment are essential to the manufacture of consistently fine end products. Constant vigilance by the fatty acid producer is the only way to give the user what he needs in a raw material.

Even the most carefully selected fats and oils may vary considerably in composition as received. Therefore, the maintenance of product quality and uniformity in the fatty acid plant depends on controls and adjustments at each step of manufacture. Visual and analytical laboratory tests must be made on the material in process from beginning to end.

These tests furnish a guide whereby the material is cut and trimmed by removal of impurities, volatiles, residues and color bodies—until the finished product fits the desired specifications.

Laboratory tests are translated into plant control by suitable adjustments of pressure, temperature, vacuum and flow rates in order to expedite removal of all undesirable constituents from the material in process.

Manual adjustments and controls are inadequate for the continuous separations taking place. Automation is the only answer. Only by the proper combination of indicator-recorder-controllers, flowmeters and motor valves is it possible to make the minute adjustments necessary for the removal of undesirable components. These adjustments must take place minute by minute, hour by hour, day and night.

Stainless steel and aluminum pumps, lines, valves and tanks must be used in processing and storage. Containers—if they are steel drums—must have baked-on liners impervious to fatty acids. Paper bags and fiber drums impregnated with special lin-

ing materials serve the same purpose. And of course the user, too, must handle the fatty acids received with care.

A. Gross & Company has been exercising this care in the manufacture of fatty acids since these compounds were first introduced commercially. The systems and safeguards developed over the years in the A. Gross plant, to assure exact adherence to demanding specifications, have helped to build A. Gross' reputation as a producer of top grade fatty acids. For information on A. Gross fatty acids such as Groco Heat-Stable Red Oils & White Oleines, send for the brochure "Fatty Acids in Modern Industry."

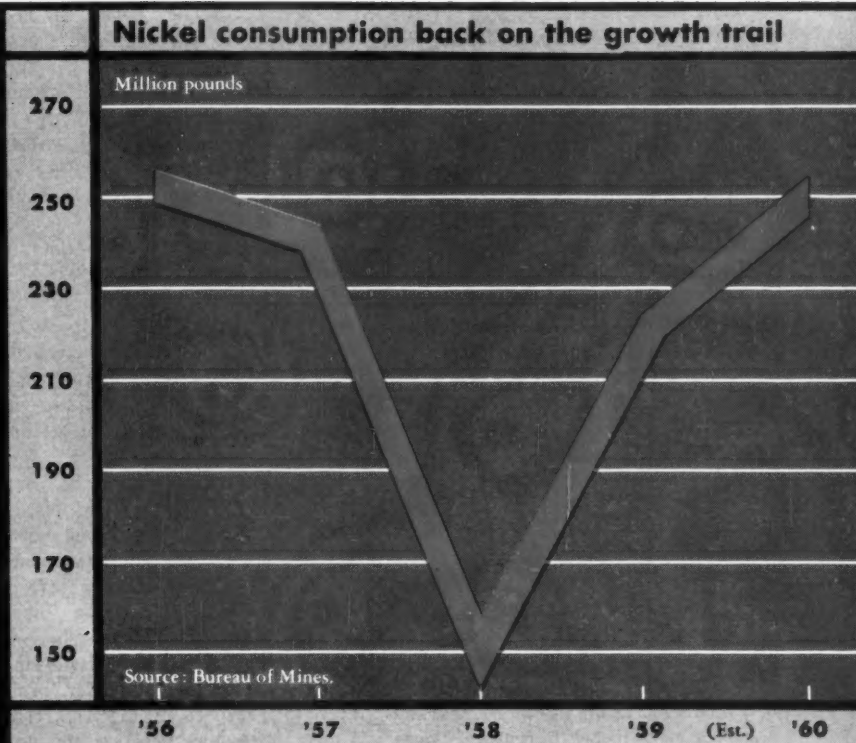


295 Madison Ave., New York 17, N. Y. • Factory: Newark, N. J.  
Distributors in principal cities • Manufacturers since 1837

Evaluate fatty acids made by A. GROSS—send for samples of: STEARIC ACIDS • RED OILS • WHITE OLEINES • TALLOW FATTY ACIDS • COCONUT FATTY ACIDS • VEGETABLE FATTY ACIDS • HYDROGENATED FATTY ACIDS • HYDROGENATED GLYCERIDES



**W**ith demand for steel expected to be heavy throughout most of '60, nickel consumption should continue its resurgence from '58's low (chart, right). Clouding this bright picture is the Cuban political situation, which menaces aspirations that the U.S. will become the world's second-largest nickel producer.



## Nickel Sales Surge into the Sixties

U.S. consumption of nickel will continue its dramatic recovery during '60, total at least 255 million lbs. for the year. This will put consumption well above the '59 mark of 225 million lbs., set the stage for even higher consumption in '61.

Helping continue the upswing after the '58 low point—lowest since '49, and 35% below '57's level—are two major factors:

(1) The settlement of the steel strike.

(2) A more abundant supply of nickel for nondefense needs.

In '59, of course, it was the rush to prepare for a steel strike that gave nickel a fast boost. Production of all types of steel, including stainless and other nickel-containing steels, was high in first-half '59; and output of nonferrous nickel alloys was also up sharply in that period. These two markets, largest outlets for nickel, account for about 70% of total U.S. consumption.

Now, with the strike settled, the

steel industry is expected to maintain peak production for the next 6-7 months, as consumers rebuild their inventories, ready for the increased demand of a growing economy. And nickel consumption is expected to soar with steel's surge.

Outside the steel industry, too, nickel use is expected to mount, stimulated by ready availability of the once-scarce metal. Only a few years ago, when the government was stockpiling nickel, users actually "designed themselves out" of nickel-containing products. For example, the steel industry developed grades of stainless and alloy steel requiring minimum amounts of nickel. The nickel plating industry applied thinner coatings.

But now, with nickel in better supply, many industries are returning to the use of the metal. At the same time, intensive market development work is being undertaken by nickel producing companies such as The International Nickel Co., Inc.

The ample supplies predicted for '60-'61 result from several factors. One is that the government's needs appear to be satisfied. Instead of looking for new purchases, the government is releasing stocks of nickel for domestic consumption. Only recently the General Services Administration announced that it will release approximately 35 million lbs. of nickel from the Defense Production Act inventory.

More than half of this (19 million lbs.) will be sold for domestic consumption, while 16 million lbs. will be used in lieu of cash for curtailments and settlements of previously negotiated nickel purchase contracts. (Total DPA stock, Dec. 31, '59, was approximately 137 million lbs.)

Moreover, new nickel-producing plants are coming onstream—total worldwide capacity is now about 540 million lbs./year, substantially more than current or immediately foreseeable needs. And producers in the Western Hemisphere can turn out

## MARKETS

450 million lbs./year alone under favorable circumstances.

**Sizable Sources:** Canada is the major nickel-producing area in the world, with an estimated capacity of 397 million lbs. in '59. The world's major producer is International Nickel, which has an output potential of 310 million lbs./year from operations in Ontario's Sudbury district. Meanwhile, the company is already nearing completion of a \$115-million project at Thompson, Man. The Thompson mine will be capable of producing 75 million lbs./year, making it the second-largest mine in the world, and increasing Inco's total potential to 385 million lbs./year.

Although the second-largest source of nickel is New Caledonia, capacity of about 68 million lbs./year, that region is followed closely by Cuba and the U.S., with an output potential of 54 and 21 million lbs./year, respectively.

The U.S. is prime user of the metal—taking about two-thirds of world consumption. This has increased from 320 million lbs. in '58 to around 400 million during '59. But demand for nickel is increasing in other countries, particularly the European nations. England, Germany, France, Sweden, Italy and Austria all have been using substantial amounts of nickel. And, as Europe's economy grows, and demand for autos, household appliances, and other nickel-consuming products trends upward, requirements for nickel will also be stepped up. In the Far East, Japan is also becoming a big consumer of nickel.

**Assured Supplies:** Requirements of many nations, including the U.S., are supplied by Canada. The U.S. government, however, has long tried to broaden its source base. During World War II, the U.S. built the Nicaro plant in Cuba. This was shut down after the war, but reopened during the Korean conflict. Today the U.S. government still owns the Nicaro works, but it is managed by Nickel Processing Corp., a subsidiary of National Lead Co. During '59, Nicaro turned out 39 million lbs. of nickel, about 70% of its 55-million-lbs./year potential.

More recently, Freeport Sulphur Co. made a try at Cuban nickel operations. Now it is caught in the web of Cuba's political turmoil.

Freeport mines its ore in Cuba and

has a plant to concentrate the nickel and cobalt ores in a slurry form. Actual metal refining, however, is to be done at a new plant at Port Nickel, La., to be supplied by special ship. The Port Nickel unit can turn out 50 million lbs. of nickel, 4.4 million lbs. of cobalt annually.

Shortly after the Cuban facilities and the Louisiana refinery were completed, the Cuban government enacted (Oct. 27, '59) Mining Law No. 617, which impose a 25% duty on the value of all minerals exported from that country. This prohibitive tax has cut off Freeport's supply of nickel ore. Moreover, since the plant has been specifically built to handle the Cuban nickel concentrates, the company has been unable to get into commercial production.

Trade observers believe, however, that a recent plan of Castro's by which the Cuban government would act as a sales agent for foreign-owned mines, may permit resumption of operations. As sales agent, the Cuban government assumes ownership of mine output. This it will sell—and export—to the highest bidder, probably to Freeport in the U.S. The Cuban government collects the normal commercial payments, returns 95% of the sales price (in Cuban pesos) to Freeport.

Another development that may mean some headway toward clearing the U.S.-Cuban muddles is the Cuban government's most recent tactic. It is permitting Freeport to ship the nickel-cobalt slurry to Port Nickel—and is not collecting the tax it just established.

The first shipment of 700,000 lbs. left Cuba about a month ago, and was passed free of all duties and axes. And this week, Freeport's specially designed nickel-slurry boat left Cuba with another cargo, this time of 1.2 million lbs., which was also cleared without payment of duties or taxes.

These shipments, however, are small for Freeport's Port Nickel operations. But they have permitted the company to start limited processing and to check out some of its equipment.

Whether the U.S. will be able to negotiate a suitable settlement in Cuba is still moot. However, with the heavy demands for nickel in prospect, U.S. interests there have

everything to gain by working out some arrangement. Lack of a settlement would not stay the coming boom in nickel consumption, but it could sharply crimp U.S. efforts to find a new source of supply.

## MARKETPLACE

**Foam Additive:** A silicone-glycol copolymer for use as a cell-control additive is now commercially available from Dow Corning Corp. Developed especially for the "one shot" polyurethane flexible foam market, the copolymer yields fine cell structures and helps produce low-density foam. Formerly called Dow Corning QF-1-0099, the commercial name has been changed to Dow Corning 199.

**Black Jelly Beans:** Use of carbon black and charcoal as coloring material in food will not be interrupted March 6, '60, according to the Food & Drug Administration. An additional year is being granted to study the use of the two coloring agents in food. Pending further study, a maximum of 0.4% of carbon black or charcoal is permitted for products such as black jelly beans and licorice candy—but the carbon black must be of the type produced by the impingement or channel process.

**More Aluminum for Autos:** Consumption of aluminum in automobile production will continue to trend upward during '60. According to Aluminum Co. of America, '60 models will take about 81 million lbs. more than the '59s did. Nearly half of this increase will stem from greater aluminum usage per car, while the remainder will result from increased auto production. Thus, if '60 production estimates are attained, about 364.8 million lbs. of aluminum will be used by the auto industry.

Several new developments will boost the trend to aluminum. Most significant: the introduction of the nation's first mass-produced aluminum engine in Chevrolet's Corvair. Aluminum will also be used in the integral wheel, brake drum and hub (offered as optional equipment on the '60 Pontiac), and in rocker arms for the '60 Buick.

Aluminum usage: 35.2 lbs. in '56; 40.5 lbs. in '57; 47.3 lbs. in '58; 50.65 lbs. in '59; estimated 56.13 lbs. in '60.

## Eastman Aldehydes

### acetaldehyde

pharmaceutical raw material  
denaturant  
chemical intermediate

### crotonaldehyde

denaturant  
chemical intermediate  
specialty solvent

### n-butyraldehyde

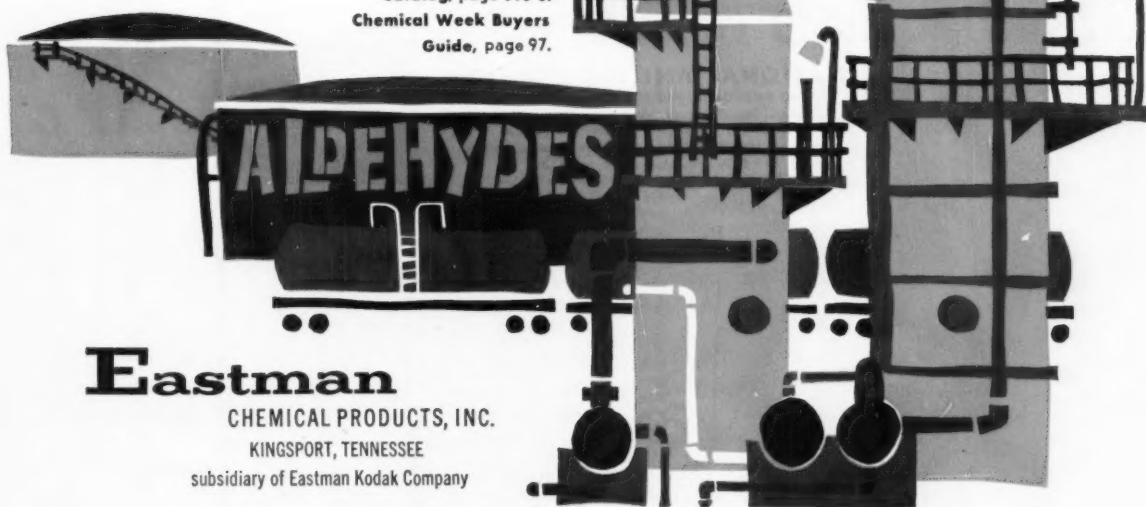
chemical intermediate  
plastic intermediate  
pharmaceutical intermediate

### isobutyraldehyde

pharmaceutical intermediate  
resin raw material  
chemical raw material

For samples and information about these  
aldehydes and other Eastman industrial  
chemicals, call our nearest sales office or write  
to Eastman Chemical Products, Inc.,  
Chemicals Division, Kingsport, Tennessee.

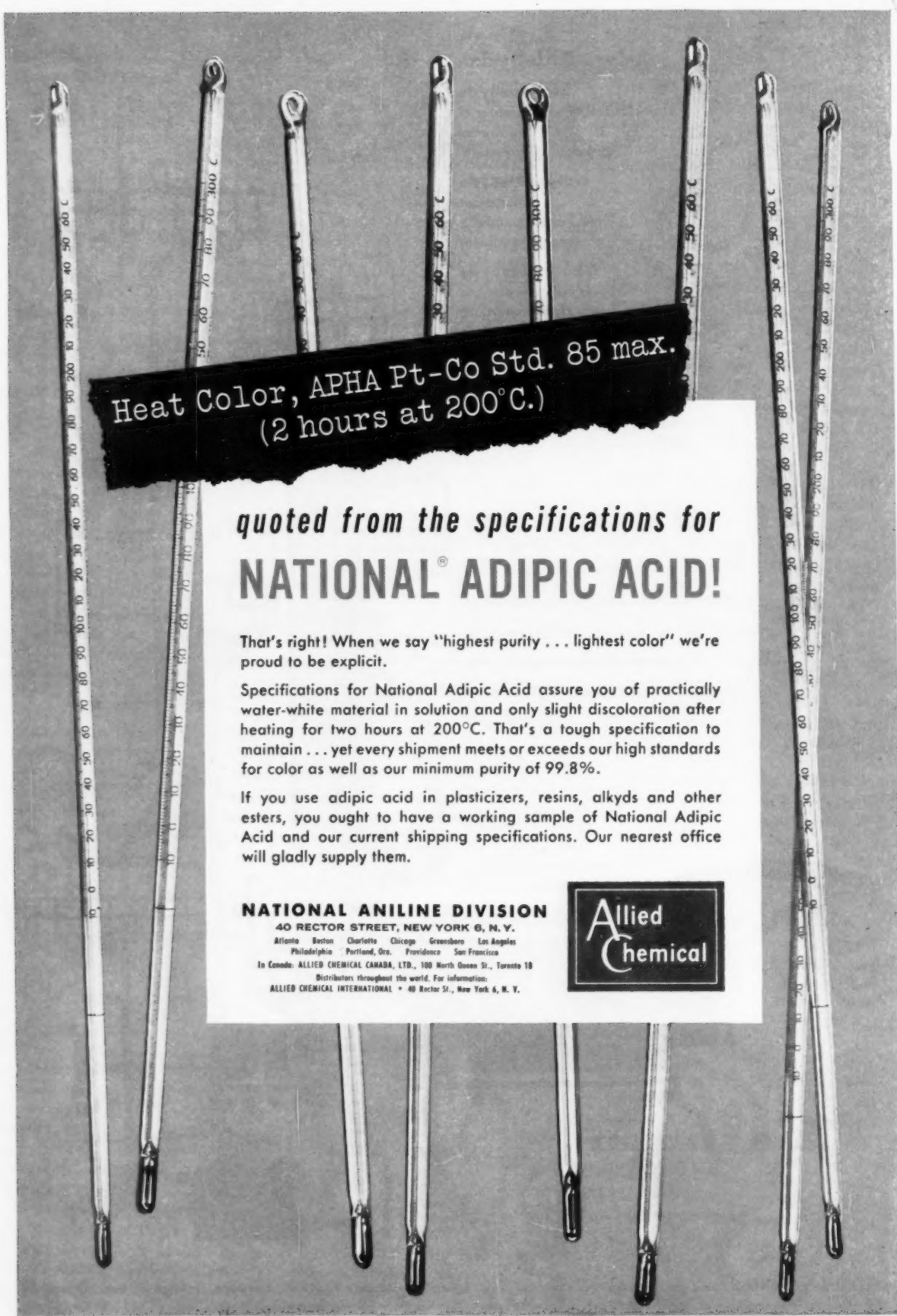
For properties and shipping  
information on these and other  
Eastman products, see  
**Chemical Materials**  
Catalog, page 395 or  
**Chemical Week Buyers**  
Guide, page 97.



**Eastman**  
CHEMICAL PRODUCTS, INC.  
KINGSPORT, TENNESSEE  
subsidiary of Eastman Kodak Company

**SALES OFFICES:** Eastman Chemical Products, Inc., Kingsport, Tenn.; Atlanta, Ga.; Chicago; Cincinnati; Cleveland; Framingham, Mass.; Greensboro, N.C.; Houston; New York City; St. Louis. **West Coast:** Wilson Meyer Co., San Francisco; Denver; Los Angeles; Phoenix; Portland; Salt Lake City; Seattle.





Heat Color, APHA Pt-Co Std. 85 max.  
(2 hours at 200°C.)

*quoted from the specifications for*  
**NATIONAL<sup>®</sup> ADIPIC ACID!**

That's right! When we say "highest purity . . . lightest color" we're proud to be explicit.

Specifications for National Adipic Acid assure you of practically water-white material in solution and only slight discoloration after heating for two hours at 200°C. That's a tough specification to maintain . . . yet every shipment meets or exceeds our high standards for color as well as our minimum purity of 99.8%.

If you use adipic acid in plasticizers, resins, alkyds and other esters, you ought to have a working sample of National Adipic Acid and our current shipping specifications. Our nearest office will gladly supply them.

**NATIONAL ANILINE DIVISION**

40 RECTOR STREET, NEW YORK 6, N. Y.

Atlanta Boston Charlotte Chicago Greensboro Los Angeles  
Philadelphia Portland, Ore. Providence San Francisco

In Canada: ALLIED CHEMICAL CANADA, LTD., 100 North Queen St., Toronto 18

Distributors throughout the world. For information:  
ALLIED CHEMICAL INTERNATIONAL • 40 Rector St., New York 6, N. Y.





# ENGINEERING



Chemico team of (left to right) Fulton, Fredrick, Handy and Curtis set company's top-management policy. CW PHOTOS—ED WALLOWITZ

## Gearing Chemico for World Competition

The four-man top-management team of Chemical Construction Corp. sat down this week to discuss, among other things, the world's population "explosion." But their conversation wasn't primarily on the sociological aspects of the problem. Rather, they see the world's increasing need for more food as a challenging opportunity for foreign operations in the design, engineering and construction of fertilizer plants and other chemical facilities needed to improve living standards.

Chemico President James Curtis and Finance Vice-President John Handy recently completed a tour of Asian countries. Gist of their report: business opportunities are good, but the financing of foreign construction

jobs still presents some tricky problems. They're confident, however, that the latter can be overcome and that foreign operations will become an increasingly valuable complement to domestic construction business.

**Management Philosophy:** This broadening of activities abroad, as well as at home, is typical of the changes wrought by the transfer of Chemico ownership from American Cyanamid to Electric Bond and Share Co. in mid-'56.

When Chemico was sold, Cyanamid retained certain key personnel, including the top-management men. To fill these gaps, Electric Bond and Share selected Curtis to head the company's expanding activities, with the aid of Handy, Engineering Vice-

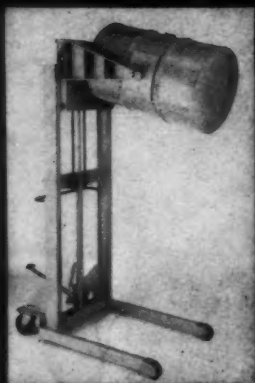


Curtis stresses 'people, know-how, follow-through.'

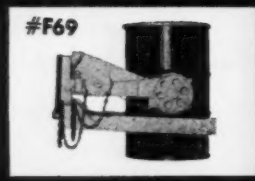
# HAMILTON DRUM HANDLERS

RACK • STACK • TIER • POUR

All One-man Controlled Safe, Easily Positioned Drum Weights to 800 lbs. Pouring heights to 103" Interchangeable Grabs, for steel or fibre drums, bags, wooden kegs or barrels, carboys and special applications.



#756. Foot pedal hydraulic lift. Pouring height to 63". Drum head extends a full 10" over rim of tank. Easy pouring tilt.



#F69. Designed to be picked up by Fork Lift Truck, which transports, raises or lowers handler and drum as a working unit for racking, stacking or pouring. No attachment to truck itself required... as quick and easy as picking up any standard pallet.

#796. Power lift (battery, air motor or explosion-proof AC motor). Pouring height 103". Stacking height 96" (to bottom of drum). Remote control by hand chain Tipper available.

SPECIALTY MACHINERY CORP.  
50 Roanoke Ave. Newark 5, N. J.

## ENGINEERING

President William Fredrick and Sales Vice-President David Fulton.

**Old-Line Know-How:** Chemico's greatest assets, Curtis believes, are its core of down-the-line engineering specialists and its backlog of proprietary know-how. "Our only asset is people," he adds. "And we are fortunate to have a group of the finest chemical engineers in the business." The management team is also unanimously agreed on the need for flexibility: "What we do today is not necessarily what we will be doing five years from now."

In keeping with these philosophies, Chemico stresses follow-through on all of its jobs, delegates responsibility for each project—from the earliest proposal stage to the startup of commercial operations—to one chemical engineer. This task-force type of project direction isn't new, says Fredrick. It was inherent in Chemico's traditional operation.

Although many engineering-construction firms dispute the merits of the task-force approach, Chemico is convinced it has many advantages over the type of organization under which each phase of a job is handled by a separate department. For one thing, says Curtis, the task force provides continuity of responsibility, "closes the cracks" that cause troubles between departments in any plant project. For another, it enhances the position of the chemical engineer, more fully utilizes his abilities.

Project leadership also develops the engineer's awareness of cost controls and other important aspects outside the strictly technical considerations of process design and engineering. Basic training and operating experience in the company's pilot plant are prerequisites for engineers. But there's no substitute, says Curtis, for the experience an engineer accumulates by having to catch his own errors and by understanding how each phase of a project relates to the others.

Perhaps the most impressive example of Chemico's application of its accumulated know-how is its record of ammonia plant construction. In the two and a half years since the present team took over, the firm has fulfilled or signed contracts for 20 ammonia plants in seven countries—including five out of the last six U.S. plants. Productive capacity of these 20 installations (about 1 mil-

lion tons/year) is said to be about 12% of the world's total. While the company is known primarily for this type of proprietary engineering, Curtis has high hopes of developing its potential in general engineering.

**Diversification:** To its line of such processes as sulfuric acid, nitric acid, phosphoric acid, ammonia, urea and fertilizers, Chemico has added 25 others—18 through licensing arrangements and seven through its own pilot-plant development program. Because each process must go through a period of semiworks-scale operation before it is offered commercially, details are lacking on several of the process acquisitions. However, two of the Chemico-developed processes—alum pressure leaching and a hydrofluoric acid process—have figured in bids; three licensed processes are being applied to jobs.

One of the problems of acquiring licenses, says Curtis, is the reluctance of commercial processors to part with hard-won know-how in exchange for dollars. Generally, they want know-how in return. Chemico's solution: set up a working "partnership" agreement, under which Chemico passes along to the new client the licensor's operating experience, while the licensor gets Chemico's basic heavy-chemicals know-how.

The company prefers lump-sum contracts because they allow the contractor the greatest freedom and flexibility, says Curtis. At the same time, it compels the engineering firm and the client to define the plant at the start of the project. Result: field changes are minimized; engineers can concentrate on the primary objective of making the plant perform as planned.

Similar teamwork with equipment suppliers is also stressed. The importance of a good working relationship between contractor and equipment fabricators is illustrated in the speed with which a nitric acid plant was recently designed and built. Because equipment suppliers gave fullest help, a job that would have required 10-12 months was accomplished in only six months, says Curtis. Completion ahead of schedule enabled the client to start up sooner, thereby reducing his payout time, and minimized the engineering overhead.

**Trying Times:** The efficacy of Chemico's top-management philoso-



## PENICK PUTS MILES AND MAN-HOURS INTO YOUR PRODUCTS

One of Penick's major services to the pharmaceutical industry combines the creation and development of commercial sources for newly discovered medicinal products of botanical origin.

Perhaps many of our customers, except those with whom we have had the privilege of close association in this work, are not fully aware of the services available to them through our diversified facilities.

For example, more than 25,000 man-hours of research and over 100,000 miles of scientific expeditions into three continents were recently invested in a program to produce a newly discovered alkaloid. Besides unearthing and developing raw material sources and perfecting extraction processes, this program succeeded in isolating and producing six related alkaloids that show promise of therapeutic significance.

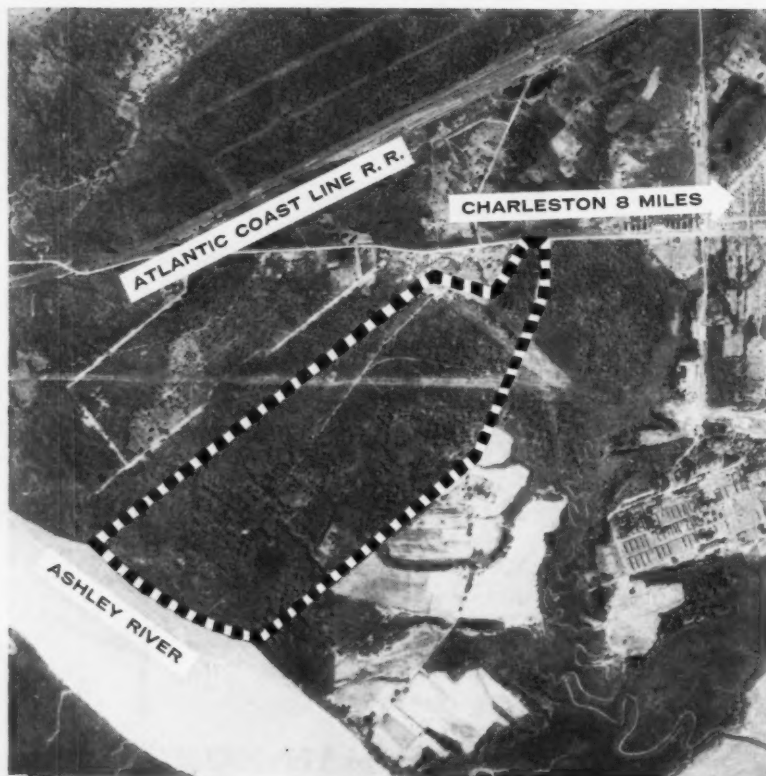
Whenever you may have occasion to use our facilities, or to explore their use for any new activity you may be contemplating, we hope you will write or phone us. Your inquiry will be handled in complete confidence at the highest level.

# PENICK

*Product Development Department*  
**S. B. PENICK & COMPANY**

100 CHURCH ST., NEW YORK 8 • 735 W. DIVISION ST., CHICAGO 10





## 345 Acres of River Site at the Port of Charleston, S. C.

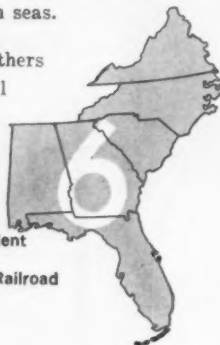
Waste disposal is no serious problem at this 345-acre site just eight miles north of Charleston, S. C., on the Ashley River. Centrally located in the Southeast Coastal 6 states of Virginia, North Carolina, South Carolina, Georgia, Florida and Alabama, this spot could put your new plant on the profit map from the first day of operation.

The population within a 25-mile radius is about 200,000, with an estimated 5,000 trained and untrained workers immediately available for industry. Power and natural gas are already at the site . . . waiting for you. Charleston is served by four airlines and three railroads, and a Coast Line main track is within one-third of a mile of the site. The Port of Charleston is your gateway to the seven seas.

Write, wire or call about this site or others in the growing Southeast Coastal 6. All inquiries treated confidentially.

**ATLANTIC  
COAST LINE  
RAILROAD**

R. P. JOBB  
Assistant Vice-President  
Department K-10  
Atlantic Coast Line Railroad  
Wilmington, N. C.



## ENGINEERING

phies has been put to the test in the past two years. The generally depressed level of new-plant construction in the CPI heightened competition among contractors, caused many to tighten corporate belts.

Chemico has maintained a fairly steady level of business on a very competitive basis, says Curtis. More important, he adds, the volume was handled at a profit. Key: cost-cutting through up-to-date budget procedures and reduction of overhead. Although the company's financial records are not made public, Electric Bond and Share's annual reports show that Chemico's contributions to corporate income have increased progressively. And it's expected that the next financial statement will show a gain over last year.

**Sales Outlook:** Chemico's sales picture has changed considerably in the past two and a half years, points out Fulton. Shortly after the switch to EB&S, about 75% of the company's work was made up of a backlog of a single company's jobs; last year it came to only about 20%. And none of that firm's work is included in the 20-25 jobs now in the shop.

Chemico has a good name abroad, says Curtis. This, coupled with the favorable business atmosphere created by President Eisenhower's goodwill tours through Asia and the Middle East, has brought in many foreign inquiries. Result: Chemico looks for a substantial increase in foreign work. As for the domestic business outlook, Curtis predicts "a gradual comeback over the next two to three years."

## Satellite Ion Engine?

An engine that obtains thrust from high-velocity electrically charged atoms (ions) is being shown off by the National Aeronautics and Space Administration's Lies Research Laboratories. The ions are created when pure cesium, a metallic element with properties similar to those of sodium, is vaporized and the vapors heated to about 3000 F. Indications are that this ion engine does not have the thrust potential that conventional liquid and solid rocket engines have, cannot be used to lift a space craft from a launching pad. It would, however, be useful in propelling a craft, once it was in space beyond the earth's gravitational field.



DO YOU BUY ANHYDROUS AMMONIA OR NITROGEN SOLUTIONS?

*Meet  
Ray  
Funk*



Ray Funk is one of the men who have helped build Standard Oil's reputation for delivering  $\text{NH}_3$  and Nitrogen Solutions on time and when promised. Working through Standard's traffic department shipments are expedited and followed closely to assure delivery. Ray's knowledge of such things as when the tank car will leave the area and the number of lines handling are what assure you that the car you've ordered will be coming onto your siding when it is due.

Ray keeps a running record of tank cars available, and he knows accurately the schedule of truck shipments. He is thus able to help customers estimate the delivery time on  $\text{NH}_3$  and Nitrogen Solutions shipped by truck.

You don't learn this job overnight. Certainly Ray didn't. He's been in the Standard Oil sales department for 22 years. Thirteen of these years have been in customer service work. Many's the time Ray has been on the telephone at home after midnight making sure someone's shipment went through on time.

Is this the attention you would like your purchases of Anhydrous Ammonia and Nitrogen Solutions to receive? Well, it's the kind of care your order gets at Standard. Get all of the facts from your Standard Oil representative. Or write, **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Ill.**

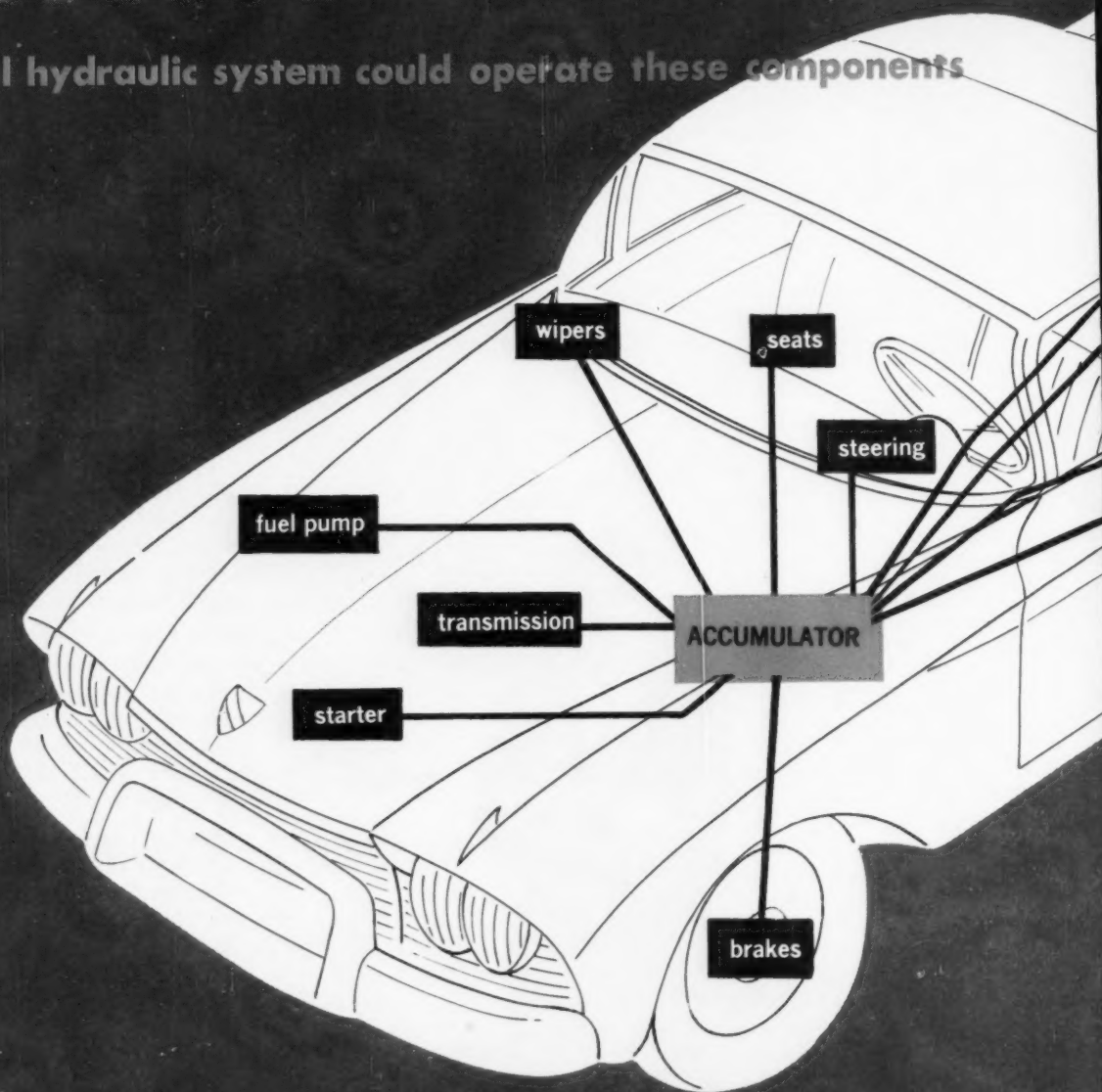
You expect more from



and you get it!

# RESEARCH

Central hydraulic system could operate these components



## Target for Tomorrow: A 'Central'

Central hydraulic systems for U.S. passenger cars — one system for brakes, steering, transmission, etc.— came a step closer to reality last week. Two technical committees\* of the Society of Automotive Engineers, meeting in Detroit (*CW Technology Newsletter*, Jan. 23), approved tentative specifications for both synthetic and petroleum-base central-system fluids. Now, chemical and oil com-

pany labs are pushing to ready fluids by late '61.

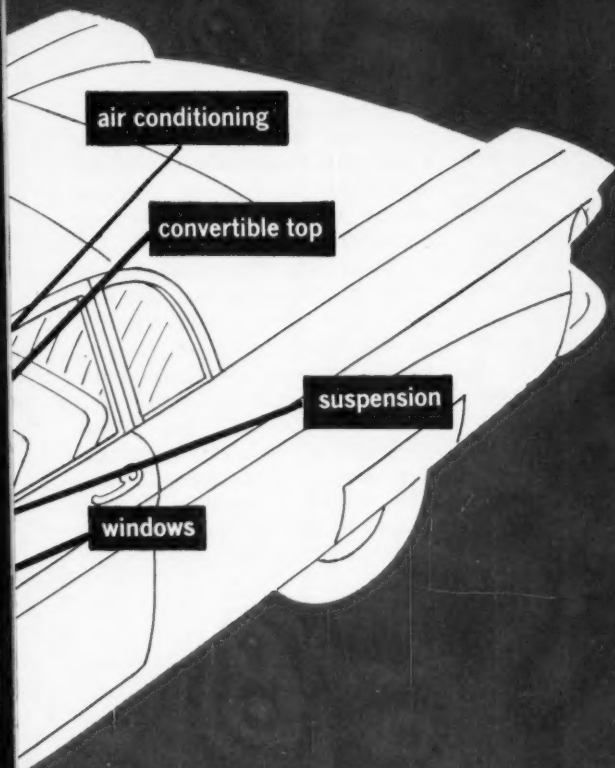
Final approval of these specifications is some months off, but automotive circles are confident that specs, fluids and systems will all meet the '61 goal for commercialization.

Likely to be introduced by Ford in '62 models of Lincoln and Thunderbird, the centralized systems may eventually provide a new-car market for 10 million gal./year of new-type fluids.

And Ford's Thomas Risk, coordinating all information on the subject for SAE, says, "We believe that installing the central hydraulic system will add nothing to the cost of the car."

**Fluids About Ready:** Fluid makers say there are suitable products ready for extensive fleet testing, which is necessary before any fluid is adopted for commercial use. Most active in the development of a synthetic central-system fluid have been Dow,

\* The fuels and lubricants technical committee and the nonmetallic materials committee.



Hydraulic fluid — synthetic or petroleum-base — is pumped from a central reservoir to the accumulator. From the latter, power can be tapped (through a system of pumps and valves) to operate any functional part of the car that is now operated hydraulically, plus most parts that now require electricity or vacuum-power.

## Hydraulic Fluid

Union Carbide and Olin Mathieson. All decline to go into chemical details, but polyglycols are undoubtedly the basic materials.

The big surprise may be the development of the first commercial petroleum-base hydraulic fluid to be approved for auto use. Nearly every major oil company is working on it, with emphasis on achieving a viscosity index of 180-190. Best bets as viscosity-improving additives: long-chain methacrylates.

Major objection to a petroleum-base fluid has been the destructive effect petroleum compounds have on natural rubber. A system designed for such fluids would require some change in construction materials—chiefly a switch to acrylonitrile rubber in the brake cups.

But auto industry spokesmen say this would be only a minor problem, if they could get an acceptable petroleum fluid for \$1-2/gal. Goal of synthetic fluid makers now is to get

the cost of their products below \$3, preferably in the \$1.50 to \$2 range. Auto makers, seeking to eliminate the current accessory dependence on electrical systems, are expected to be willing to pay up to \$3/gal., however, if cheaper fluids can't be worked out.

Each car would require 1 to 2½ gal. of fluid, depending on the number of accessories added to the system, and changes will be recommended every 25-30,000 miles. If the new systems work out well in the luxury cars, where the fluid markets will be limited, they will likely find their way into the lower-priced models. With this shift will come the major markets for the preferred fluids.

**Tougher Specs:** Whichever type of fluid wins out will have to meet SAE's rigid new standards (70R4 for synthetic central-system fluids and 71R for the new petroleum compounds), once they are finally approved.

For instance, the new standards will call for an unusual viscosity-temperature relationship to meet the different requirements of brakes and power steering. The new fluids will have to have the low viscosity of a brake fluid at -40 F, and the relatively high viscosity of Type A automatic transmission fluid (commonly used for power steering) at 210 F.

Flash and boiling points will also be higher than in current brake-fluid specifications, and the lubricity and oxidation-resistance requirements will be significantly stiffer.

**In Front:** Now employing a central hydraulic system is the French Citroen DS19, which was introduced in late '56. It uses a heavy-duty synthetic, conforming to SAE standard 70R1, now required by law in 14 states as a minimum specification for brake fluid.

Items powered by the Citroen's central system are the automatic clutch, suspension, power brakes and power steering. Other hydraulically powered parts envisioned by American designers include automatic transmission, fuel pump and injection equipment, air conditioning, starter, windshield wipers, window lifts, adjustable seats and convertible-top mechanism.

Some of these items will probably



smells?

**Call on Rhodia**  
**"Odor Engineering" to solve**  
**your malodor problems**  
**in plant or product**

Rhodia Inc. is the world leader in industrial odor control and reodorization technology and a primary producer of industrial aromatic chemicals. It offers fully qualified consultation service anywhere in the United States without cost or obligation.

RHODIA INC.,  
60 East 56 St., New York 22, New York  
Gentlemen:  
Please send me Rhodia literature.  
My problem is: (please give specifics)

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

**RHODIA INC.**

60 East 56 St., New York 22, New York  
(Phone: PLaza 3-4850)

## RESEARCH

be missing from the first commercial system offered in the U.S. One large automotive supplier, which says it has a central hydraulic system in an advanced stage, points out that 3-5,000 psi. of hydraulic pressure would be needed to operate a starter, and that it doesn't expect automatic transmission to be included. Moreover, it says it has solved the leakage problem that caused some observers to doubt the feasibility of operating window lifts hydraulically.

**Safety Provisions:** Any new system offered will get close scrutiny from the safety angle, of course. It will probably include an extra accumulator as a safety factor for the braking system.

Other probable safety points: complete elimination of water from a petroleum-base system; compatibility of synthetic and petroleum fluids with other fluids of their respective type and with all components of the systems; safeguards against putting one type of fluid in a system designed for the other.

These considerations dictate a conservative approach in commercializing central hydraulic systems, but there's no doubt that the remaining problems can be solved.

## Glycerine Kudos

Annual research awards were made last week by The Glycerine Producer's Assn. (New York). The three prize-winning ideas:

- Use of glycerine in preserving dog hearts for transplanting studies.
- A method of extending the motility and fertility of bull spermatozoa using glycerine as a diluent.
- Preparation of pure symmetrical and unsymmetrical mixed triglycerides of stearic and linoleic acids and their intermediates, and investigation of their properties.

A special award was made to a research team at Lansdale Tube Co. (Lansdale, Pa.), division of Philco Corp., for the development of glycerine baths in electrodeposition of various low-melting metals and alloys. This finding permits automated, mass-production soldering of extremely delicate lead wires to high-frequency transistors. The latter are used in very high-speed, solid-state computers and high-frequency transistorized communications equipment.

## Film Find

**"Polymorphous" polyethylene**, a new film developed by Spencer Chemical and claimed to have "unusual" clarity and strength, will seek a share of the 240-million-lbs./year polyethylene packaging market. Key to these properties is control of crystal growth during film extrusion, according to George Ham, Spencer's plastics technical director. He says crystals are kept small, result in film with 10-15% better clarity than conventional polyethylene film. Impact resistance is raised 20%, resistance to straight line tears is upped 20-25%. The newcomer (available in three grades) is also said to be easier to extrude than are comparable resins.

## PRODUCTS

**Radiochemicals:** Carbon-14 labeled organics newly available from Tracerlab (Waltham, Mass.) include acetone 1, 3-C<sup>14</sup>; bromoacetic acid 1 and 2-C<sup>14</sup> and malonic acid 1, 3-C<sup>14</sup> (both compounds useful in synthesis of amino acids); propylene 1-C<sup>14</sup> (for determining chemical reactions and "metabolic fate"); tristearin carboxyl-C<sup>14</sup> (for studies in metabolism of fats).

**More Tracers:** Nuclear-Chicago Corp. (Des Plaines, Ill.) is out with two new labeled compounds: adenosine-8-C<sup>14</sup>, for studies of carbohydrate metabolism, and  $\alpha$ -amino isobutyric-1-C<sup>14</sup> acid, for protein research.

**Ultrafine Powder:** Iron oxide in particle sizes from 200-1000 Angstrom units is now available in sample quantities from Vitro Laboratories (West Orange, N.J.), division of Vitro Corp. of America. The fine iron oxide is the newest in a series of powders produced in a development program utilizing a high-intensity electric arc.

## EXPANSION

• Bunting Brass & Bronze Co. (Toledo, O.) has enlarged its research and engineering department, named Ralph Schaefer director of research and development.

• Knapp Electro-Physics, Inc. (Palo Alto, Calif.), has expanded its facilities for R&D in semiconductors. The firm is a major supplier of grown





**NOW...**

**instant color  
development**

**with**

**CELLOSIZE**

Hydroxyethyl Cellulose

**WP-4400**

*Why spend time and money to make up a separate thickener solution? CELLOSIZE Hydroxyethyl Cellulose WP-4400 may be dry-blended or ground with pigments. WP-4400 allows instant color development with phthalo colors used to tint the system during the hot let-down. The viscosity of your latex paint emulsion can also be easily controlled with WP-4400. Even in low concentrations, you get high thickening. And WP-4400 adds longer shelf life and temperature stability.*

Clear, bright colors with minimum sheen and color variation are assured when you formulate with WP-4400. Your paints flow easily, are easy to brush on, and have excellent scrub resistance—benefits your customers like.

CELLOSIZE WP-4400 is soluble and non-gelling in water, up to the boiling point. Its ease of solution and low-foaming properties speed paint preparation.

Order CELLOSIZE WP-4400 in LCL or carload lots. For more information, and new technical data sheets, ask a Technical Representative in any CARBIDE Office. Or write Dept. HW Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

*"Cellosize" and "Union Carbide" are registered trademarks of Union Carbide Corporation.*

**UNION CARBIDE  
CHEMICALS COMPANY**



# SODIUM BICARBONATE, U.S.P.

*Specialized Grain Sizes*

## MONOHYDRATE of SODA

### CON SAL

CONCENTRATED CARBONATE  
OF SODA CRYSTALS

*Technical Service*

## CHURCH & DWIGHT CO., Inc.

70 Pine Street New York 5, N.Y.

Phone DIgby 4-2181

*A LEADER IN BIOCHEMICAL RESEARCH*

*attention:*



PRODUCT DEVELOPMENT DIRECTOR ✓

PURCHASING DIRECTOR ✓

RESEARCH DIRECTOR ✓

SALES DIRECTOR ✓

offers over 60 regular items  
to the pharmaceutical...cosmetic...dairy  
...and chemical industries...including—

ENZYMES • ANTIOXIDANTS • HORMONES  
FINE CHEMICALS • GLANDULARS

plus 20 items for experimental purposes,  
such as—ANIMAL BLOOD FRACTIONS,  
ORGANIC CHEMICALS, BIOCHEMICALS,  
INCLUDING SPECIAL ENZYMES

For more information, contact our technical representa-  
tives. Call WElls 2-6771 in Kankakee, Illinois. Or write to:

*Bio-Chemical Dept.*

ARMOUR PHARMACEUTICAL COMPANY  
Kankakee, Illinois



## RESEARCH

silicon monocrystals for semiconduc-  
tors, also produces germanium mono-  
crystals and large-diameter silicon and  
germanium ingots for infrared lenses  
used in surveillance and missiles guid-  
ance systems.

• Thiokol Chemical Corp. will  
set up an administration center in  
Ogden, Utah, for its rocket research,  
development and production opera-  
tions in Utah, Texas, Alabama, Mary-  
land and New Jersey.

• The Anaconda Co. (Butte,  
Mont.) has reorganized its research  
department, added sections in chem-  
ical, ore concentration, and pyro-  
metallurgical research. Lab director is  
Francis Holderreed.

• American Brass Co. (Buffalo,  
N.Y.) will build a \$1.5-million re-  
search center in Waterbury, Conn.,  
this year.

• Hummel Chemical Co., Inc.  
(New York), has opened a new re-  
search laboratory with facilities for  
R&D in propellents.



### Uranium Squeezer

Pressures of more than 1 million  
lbs./sq.in. at temperatures higher  
than 3600 F can be attained by this  
new equipment at Battelle Memorial  
Institute (Columbus, O.), operated by  
physicist Wendell Wilson in research  
for the Atomic Energy Commission.  
The device has yielded a new form  
of uranium oxide ( $\gamma\text{-U}_3\text{O}_8$ ),  
may help discover novel, useful varia-  
tions of other materials and minerals.  
It simulates temperature and pressure  
200 miles below the earth's surface,  
conditions suitable for diamond for-  
mation.

JUST LOOK AT FRONTIER'S NEW

# 1960 MODELS



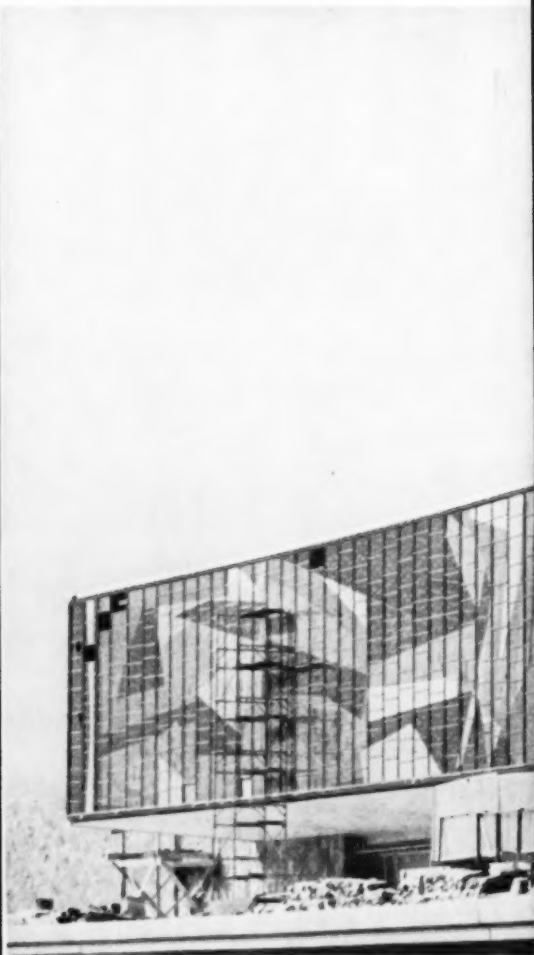
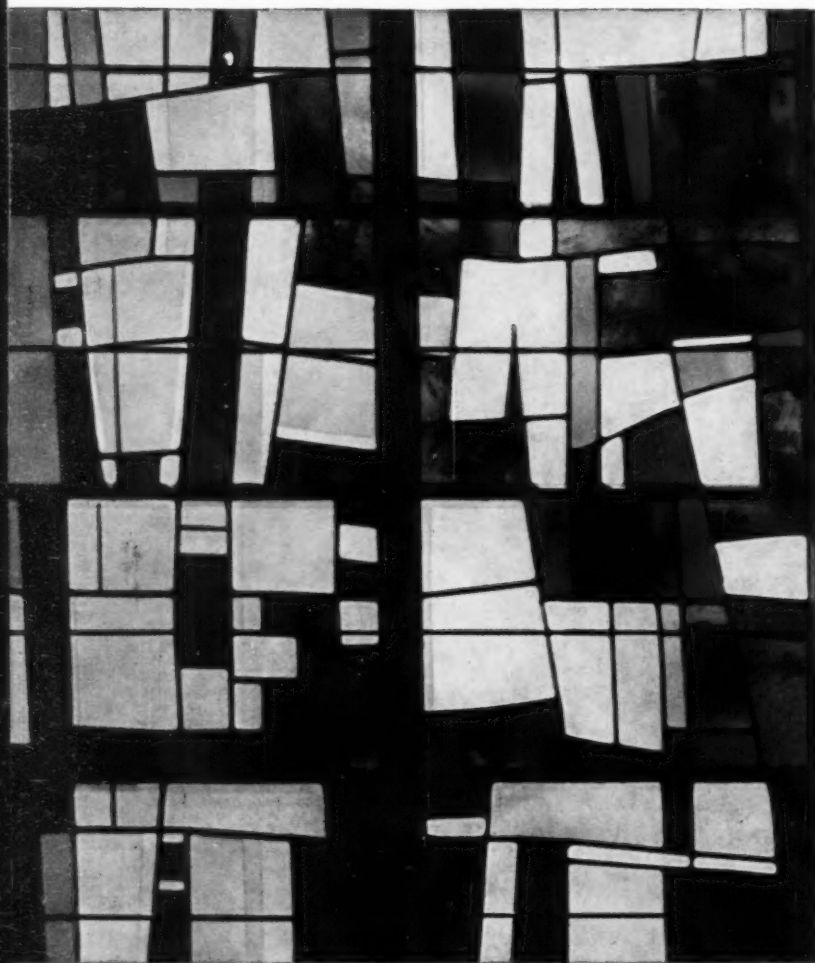
*One of these bright beauties should look very nice on your rail siding, with its sparkling new color scheme. The contents are good, too — Frontier quality-controlled 73% liquid caustic soda, in this case, or muriatic acid, chlorine, or chlorinated solvents if you prefer. You can count on prompt shipments over uncongested routes from Frontier, newest of Mid-America's basic producers — and friendly service before and after the sale. We also make quick deliveries of all products to many off-rail points via Frontier's own highway truck-trailer fleet. We shall welcome your inquiry.*

**FRONTIER CHEMICAL COMPANY**

*division*  
**VULCAN MATERIALS COMPANY**

P.O. BOX 545 — WICHITA, KANSAS

# SPECIALTIES



## Colorful Buildings Create Chemical

A marriage of medieval crafts and modern science went into the making of the new, \$14-million passenger terminal to be opened by American Airlines at New York's International Airport next month. A stained-glass window (the glass for which was made in Germany) comprises the building's 317-ft.-long, 23-ft.-high upper facade.

The window is dramatic evidence of an architectural trend that has direct bearing on makers of chemicals and chemical specialties. Modern box-like functional buildings with their large unbroken expanses of glass, metal and stone offer a growing market for construction materials that

allow a variety of texture and color within this spartan format.

Producers of anodized aluminum and vitreous enamel are among those that have already profited. And makers of other, less-obvious, materials, should also benefit. Case in point: sealants. Both noise from jet aircraft and unimpeded high winds make it extremely important that the huge American Airlines stained-glass window be tightly sealed in place.

To accomplish this, The Grenadier Corp. (New York), subcontractor for masonry and waterproofing, used over 200 gal. of Thiokol polysulfide sealant. Cost: \$3,000—low in relation to the investment the sealant is

protecting. Total cost of the window is pegged at about \$300,000.

In addition to the Thiokol-rubber sealant, designers of the window called on a more venerable material. Altogether some 29 tons of lead were used in constructing the colorful showpiece. And about 8,000 ft. of neoprene stripping was required to mount the "lights" (the rectangular panels into which the glass pieces are set).

The American Airlines building may be the most spectacular, but it is hardly the only example of stained glass in modern construction. Rather it's one of a growing number of instances of the use of stained glass in



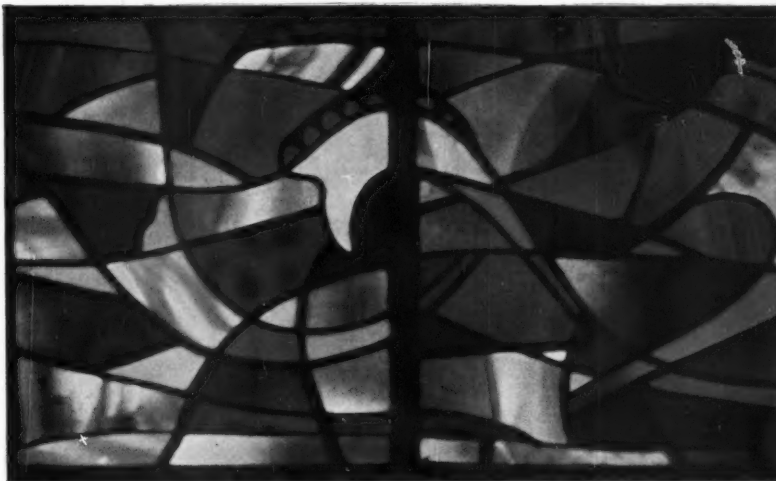


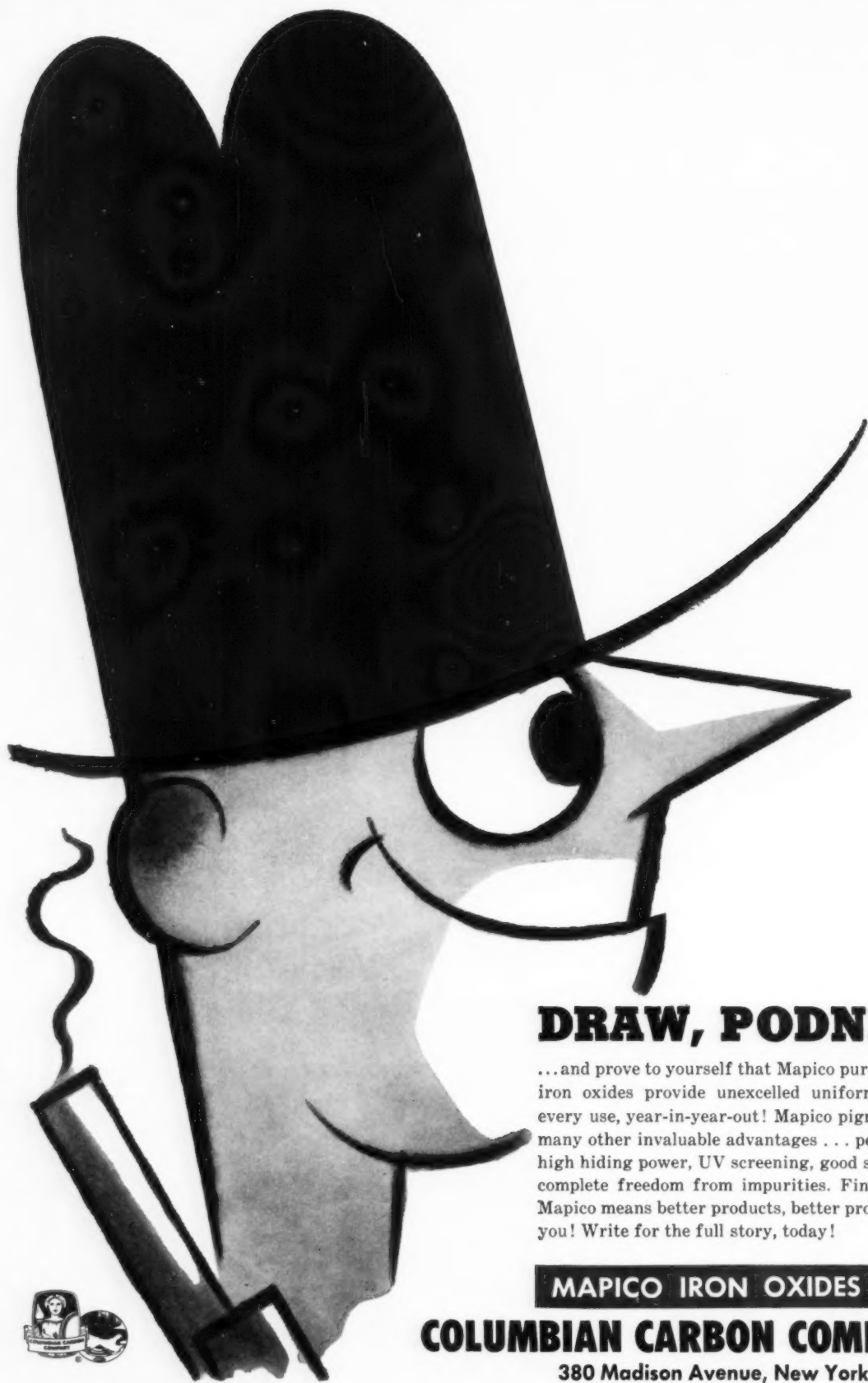
## Markets

interior and exterior applications.

Other recent examples: Canada House, the American Export Co. building, and the Manufacturers Trust Co. building (all in New York), Hertz Hall, at the University of California, and Monsanto's inorganic chemicals division laboratories (St. Louis). The last-named is of particular interest to chemical producers—its construction required the sandwiching of stained-glass panes between layers of glass-reinforced polyester resin. Possible next step: all-plastic "stained glass" to enhance buildings of the future, further point up the unfolding opportunities for chemicals in modern building.

Stained glass not only is enjoying a revival in religious structures (left and below) but also is being used increasingly in public buildings—e.g., the new American Airlines terminal (above) in New York.





## **DRAW, PODNER!**

...and prove to yourself that Mapico pure synthetic iron oxides provide unexcelled uniformity — for every use, year-in-year-out! Mapico pigments offer many other invaluable advantages . . . permanence, high hiding power, UV screening, good suspension, complete freedom from impurities. Find out why Mapico means better products, better profits . . . for you! Write for the full story, today!

**MAPICO IRON OXIDES UNIT**

**COLUMBIAN CARBON COMPANY**

380 Madison Avenue, New York 17, N. Y.



CW PHOTO—ED WALLOWITCH

Meer's Ellis Meer and Arthur Curran discuss expansion plans.

## New Boost for Botanicals

**Top management at Meer Corp.** (New York) is carefully scrutinizing plant location data this week. Object: to find the best spot for a new plant to serve the company's growing list of West Coast customers. Meer, one of the few U.S. companies devoted entirely to natural products, is enjoying record sales (up 15% in '59) in a field many believe to be going downhill. Last year's sales weren't freakish, either; sales volume for the company is currently nearly three times the mark of 10 years ago.

Besides trying to establish a new Western operation, the company is putting plans together for development of a 160-acre plot recently purchased in Bloomingdale, N.J. It's the company's intention to locate most of its manufacturing operations there. Only part of the manufacturing, and most warehousing, would remain at the present seven-acre North Bergen, N.J., installation. The North Bergen plant consists of a six-building complex. A new, 320,000-cu. ft. warehouse was just added, another one is under way, and a third is in the planning stage. There are no plans to switch sales and executive personnel from their Manhattan location.

Unlike many companies that at-

tribute plant expansion and/or growing sales to excursions into other fields, Meer has upped business by sticking to the same general area. About 35% of its business is in gums, 25% in drug and flavor extracts, 40% in botanicals in processed and semi-processed form.

Besides including such familiar items as gum arabic, locust bean gums, and gum tragacanth, the company's product list—better than 1,000 items long—has such exotic-sounding items as prickly ash bark, skunk cabbage root, ipecac, pigweed, deer's tongue leaves, bittersweet twigs, snake root button and figwort. Not all of these—carried to complete a line—are profit items, however; the company figures that it can usually count on only 20% of its line being money makers.

**Synthetic Competition:** Company officials candidly reply that "any of our products might be in danger of replacement by synthetics, in any particular application for which that product is used." The company feels, however, that it has enough products in such a variety of fields that it need not worry about synthetics' replacing any of them. The company's increasing emphasis on research is

## How to COOL CURING of furniture lacquers

Furniture manufacturers who use V-C Acid Phosphates as catalysts for lacquer can cut curing temperatures to 140°F, or even lower! Resultant finishes are hard and tough... have excellent cold-check resistance... shrug off cigarette burns, alcohol spills and other solvents. In addition, V-C Acid Phosphates permit formulation at high solids, which makes it possible to finish with a minimum number of coats.

**V-C Acid Phosphates** are strong organic acids which form useful salts with alkali and amines. *Purity and lightness of color are outstanding.* Solubilities change with chain length. Available as liquids and waxy solids. Types include Methyl, Ethyl, Butyl, Isooctyl, Phenyl, Octylphenyl, Stearyl, and Bis (2-ethylhexyl) Hydrogen Phosphate.

**FOR SAMPLES** and more information on V-C Acid Phosphates as catalysts for wood finishes, write: *Virginia-Carolina Chemical Corporation, 401 East Main Street, Richmond 8, Virginia.*

**V-C<sup>®</sup> ACID  
PHOSPHATES**

# important announcement to users of Polyethylene Glycols

Allied Chemical's Orange, Texas plant now  
on stream—Available are PEG 200, 300,  
400, 600, 1000  
and 1450



BASIC TO  
AMERICA'S  
PROGRESS



Allied Chemical's new PEG unit at its Orange, Texas plant — now in operation — offers you a dependable source for your polyethylene glycol needs.

Allied Chemical's new production facilities make PEG available in tankcar quantities or in combination shipments with other glycols or ethanolamines. They are ready for prompt shipment from Orange or from conveniently located stock points throughout the country.

Write today for an informative product bulletin, specifications, delivery and price information. Or, for immediate service, phone Allied Chemical at the address below.

#### NITROGEN DIVISION

Dept. PG 1-7-1, 40 Rector Street, New York 6, N. Y.  
(HAnover 2-7300)



## SPECIALTIES

also counted on heavily to find and exploit new products and processes.

Other factors seem to augur a long future in sales of natural products for Meer—and others in that industry. Not only has there been increased interest in natural products by the drug and food industry; there has also been an incentive—in the form of stricter food laws—for companies to use the natural products rather than go through the expensive, lengthy testing of synthetic materials.

**Gum Start:** A privately owned company, Meer was founded in 1926 by Ellis Meer, who came to the U.S. from Iran. In the company's early days, gum tragacanth was an important item in the product lineup. It still is. With strong connections in Eastern markets through Iranian friends, Meer gradually took on more products until he was carrying his present long list.

In the company with Ellis, who is the president, are three of his brothers—George, who is vice-president; Victor, the treasurer; and Sulman, who heads the corporation's Iran office. Two other Meers—the sons of George Meer, Sr.—also serve the firm. George Meer, Jr., is technical director and his brother William is in charge of quality control. Arthur Curran, sales manager, directs the company's nine full-time salesmen—all of whom sell direct rather than through jobbers—and 17 sales representatives.

This sales team is expected to hike sales 20% this year over the '59 mark. The secret: staying "natural."

## EXPANSION

**Northam Warren Expands:** Construction of a new office and warehouse building in South San Francisco Industrial Park has been started by Northam Warren, manufacturer and distributor of Cutex nail polish, lipstick and Odorono. The new building will serve as Pacific Coast branch headquarters for the company. The new structure, with 15,000 sq. ft. of space, will be owned by Utah Construction & Mining Co. and leased to Northam Warren.

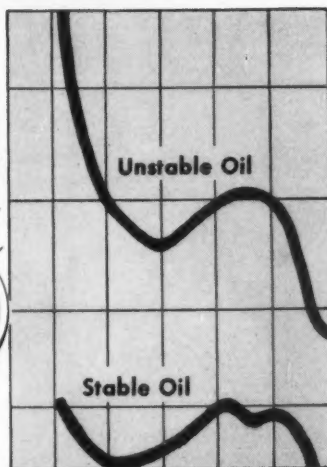
**Camp Chemical:** Entry into the aerosol field has been made by Camp Chemical (Brooklyn, N.Y.), manufacturer of chemicals for sewage treat-

# White Oils

## with

## Scientifically Predictable

## Stability



Wave length—AU

STICIZERS •  
PROCESS OILS •  
ACTION MEDIA • LA  
TEXTILE SPECIALTIES  
IC RAW MATERIALS • P  
ANTICAKING AGENTS • R  
LIPHATIC RAW MATERIAL  
• DETACKIFYING AGENTS  
EDIA • LAXATIVES • ANTI  
PROCESS OILS • TEXTILE  
• PAPER SATURANTS  
S • PLASTICIZERS  
C RAW MATERIAL  
ANTICAKING

**Achievement**—a new standard of white oil purity and stability! Through Spectrophotometric Analysis, Penn-Drake detects then eliminates the most minute impurities (even as low as 1 or 2 parts per million) which tend to decompose and impart an objectionable odor to the oils upon exposure to light.

As pioneers in the development of white oils with scientifically predictable light and heat stability, Penn-Drake has broadened the range of potential applications. Can we help you solve production or storage life problems?

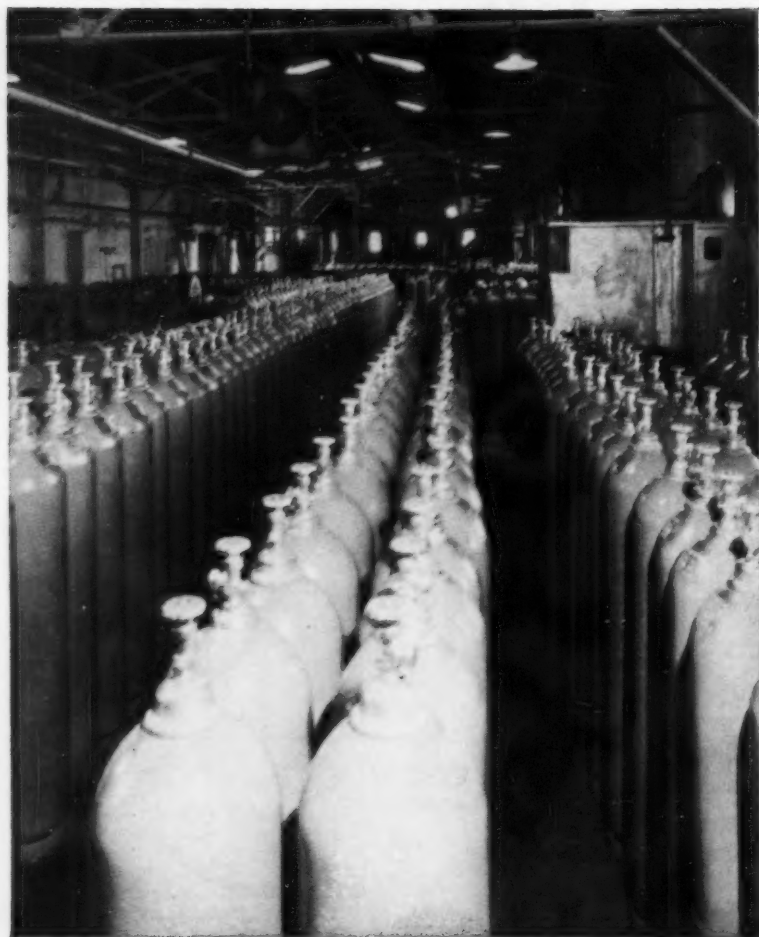
Write for data on Penn-Drake White Oils with scientifically predictable stability.



**Penn-Drake®**  
**WHITE OILS**

PENNSYLVANIA  
REFINING COMPANY  
Butler 20, Pennsylvania

Branches: Cleveland, Ohio  
and Edgewater, N. J.



### Production is Profit in Tidewater Virginia

Join the industrial march to Tidewater—the rapidly expanding Tidewater Virginia area which wants and welcomes your company—and cash in on "Production is Profit in Tidewater Virginia."

Production and profits are easier with such factors as . . . the unequaled deep water port facilities of Hampton Roads . . . the services of eight trunkline railroads . . . abundant labor . . . a centralized location in the heart of a vast growing consumer and industrial market. Important too, is the friendly living and business climate that enables you, your company and employees to prosper and enjoy life.

For a confidential, specifically tailored study, showing the advantages of plant location for your firm in Tidewater Virginia, please contact:

*Clarence H. Osthagen*  
Vice President and Executive Director



## Tidewater Virginia Development Council

300 Boush Street

Norfolk, Va.

### SPECIALTIES

ment. Five products are manufactured now, with a dozen contemplated for the next few months. Two room deodorants, a garbage deodorant, a roach and ant killer, and a garden insect killer are being offered in 12-oz. cans.

**Bourjois, Inc.:** Helene Pessl (New York), maker of children's toiletries, has been purchased by Bourjois, Inc. Arnold Perlman, founder of Helene Pessl, will continue with Bourjois's new subsidiary as an advisor.

**Fuller Brush:** Fuller Brush Co. dedicated its new \$6.5-million plant in East Hartford, Conn., last week. The facilities cover seven acres on an 84-acre suburban site, and include a hospital, post office, printing plant, and research and engineering labs.

The new plant—the eighth home for the 54-year-old company—was constructed by Walter Kidde Constructors, Inc. (New York), and will employ about 800 persons.

### PRODUCTS

**Instrument Cleaner:** A cleaning system for aviation, automotive, marine, industrial and laboratory instruments is being marketed by Clarkson Laboratories, Inc. (930 North Darien St., Philadelphia). A scrubbing with Instru-Kleen A—a noncorrosive, non-chlorinated liquid cleaner—is followed by application of Instru-Kleen B, an air-drying solvent rinse. The duo can be used for either machine or manual cleaning.

**Powdered Mouth Wash:** W. F. Young, Inc. (Springfield, Mass.) is test marketing a new mouth wash that has the unusual feature of being sold with throw-away paper cups. Absorb:Breath is a powdered concentrate. The user measures it into a 1½-oz. cup, adds water, gargles, and discards cup. Retail price: 59¢/12 applications.

**Winter Car Items:** Consolidated Research and Manufacturing Corp. (New Haven, Conn.) has begun distribution of three aerosol aids for motorists: Free O'Ice to keep ice off windshields; Snow Off to prevent snow accumulation; and Free O'Mist to keep windows from fogging. First two retail at \$1.98 for a 10-oz. aerosol can, the other costs 98¢ for an 8-oz. can.

# BRIEFS

benzoyl chloride in carboys or carloads  
phosphorus oxychloride as a chlorinating agent  
liquid caustic soda—which strength is right for you



## BENZOYL CHLORIDE ... BUY A CARBOY OR A CARLOAD

Any quantity of this Hooker compound assays 99% pure benzoyl chloride on a hydrolyzable chlorine basis.

It makes a fine carrier of the benzoyl group for Friedel-Craft reactions and as an intermediate for such chemicals as benzoyl peroxide, benzophenone, and benzyl benzoate.

It boils at 197.3°C., distills over a 3.5°C. range. Freezing point never goes lower than a minus 0.9°C.

For complete details on this versatile compound, just check and send the coupon.



## PHOSPHORUS OXYCHLORIDE ... INVESTIGATE IT!

It may pay you to look into this Hooker chemical if you're developing organic phosphates or plasticizers, gasoline additives, fire-resistant hydraulic fluids, or chlorinated products.

As a chlorinating agent, it neatly supplements and broadens your already wide choice of Hooker chlorine compounds. It's used also as a catalyst for intermediates and dyestuffs, and in the preparation of medicinals such as sulfa drugs.

For technical data sheet, just check the coupon.

## 50% TO 73% CAUSTIC SODA ... DOES IT PAY TO SWITCH?

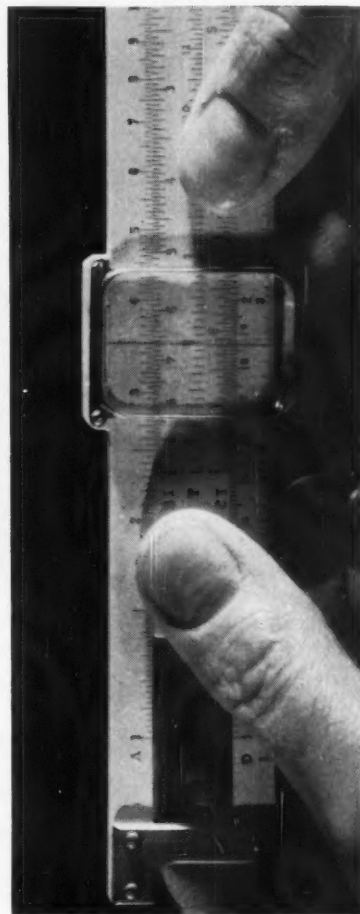
It depends.

Check your savings on freight for 73% caustic. Then subtract the annual depreciation on the dilution equipment you'll need.

If you still show a saving, it would be wise to consider the big switch seriously.

We'll be glad to help you survey the economics of 50% versus 73% caustic. Just send for a copy of our Caustic Soda Buyer's Guide. It contains a handy nomograph that helps you estimate possible annual savings on 73% caustic soda.

Our representative can help you with further details. Just write our nearest Hooker sales office.



For more information on chemicals mentioned on this page, check here:

- ☐ Benzoyl Chloride Data Sheet      ☐ Caustic Soda Buyer's Guide  
☐ Phosphorus Oxychloride Data Sheet      ☐ Caustic Soda Data Sheet

### HOOKER CHEMICAL CORPORATION

701-2 Forty-Seventh Street, Niagara Falls, New York

Sales Offices: Buffalo Chicago Detroit Los Angeles New York  
Niagara Falls Philadelphia Tacoma Worcester, Mass.  
In Canada: Hooker Chemicals Limited, North Vancouver, B. C.





**QUALITY  
TALL  
OIL  
FOR  
THOUSANDS  
OF INDUSTRIAL  
FORMULATIONS**



Tall Oil and its derivatives are vital in a multitude of formulations to hundreds of industries. For their supplies of these essential materials, industrial leaders turn to Arizona. They know they can rely on the uniformity of Arizona's quality tall oil products. Uniformity that saves time and money, eliminates formulation adjustment, keeps processes constant, product quality consistent. They also rely on the swift dependability of Arizona service. Discover how you can benefit from Arizona quality, uniformity and service. Call Arizona next time you need tall oil.

# ARIZONA

## CHEMICAL COMPANY

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

**DISTRIBUTORS:** A. J. Lynch & Company, Los Angeles, Alameda • Charles Albert Smith Ltd., Toronto, Montreal, Vancouver • T. G. Cooper & Company, Inc., Philadelphia • Farac Oil and Chemical Company, Chicago • George E. Moser & Son, Inc., Detroit • Donald McKay Smith Company, Cleveland • Thompson-Hayward Chemical Company, Houston and New Orleans • Van Waters & Rogers, Inc., Dallas • N. S. Wilson & Sons, Boston • M. J. Daly Company, Ludlow, Ky. • Great Western Chemical Company, Seattle, Spokane, and Portland (Oregon) • Welch, Holme & Clark Company, Inc., New York • Whitaker Oil Co., Atlanta, Georgia

**ACINTOL® Products:**  
ACINTOL D and ACINTOL DLR Special Distilled Tall Oil • ACINTOL FA 1, FA 1 Special and FA 2 Tall Oil Fatty Acids • ACINTOL R Tall Oil Rosin • ACINTOL P Tall Oil Pitch • ACINTENE® Terpenes



# PRODUCTION

## FOR CLARIFYING LIQUIDS

*These choices*

*... for these conditions*

### Filters

**Press types**

**For high-viscosity liquids, high pressure drops, high capacities requiring 300-400 sq. ft. of filter area.**

**Cartridge types**

**For low capacities, easy cleaning, pressure drop across the filter element not over 100-150 psi.**

### Elements

**Porous metals**

**For temperatures over 500 F where cheaper elements can't be used; cleaning, reuse can help offset cost.**

**Nonwoven fabrics**

**For temperatures up to 350 for most synthetics, 500 F for Teflon; low cost permits throw-away after use.**

## Clarifying the Future of Fine Filtration

This week at Glenville, Conn., American Felt Co. is readying tests on a new silk felt developed for fine clarification of liquids. The tests, designed to show particle-size retention and plug-free life, will help cut trial-and-error time in finding the best ways to trap small amounts of solids in process liquids. Also, these tests point to the need for more standardized filter-test procedures, if "clarification" filter elements are to gain a bigger role in chemical processing.

Despite some severe problems in designing and proving out filter elements, the need for quality improvement is already forcing the CPI to spend a steadily increasing sum for fine filtration. Currently, nearly half the process industries' filter bill is for clarification equipment. (The other half is taken up by cake filtration, where there is enough solid material in the slurry—usually at least 1%—to quickly form a cake on the filter cloth.)

**New Roles:** Fine filter equipment makers are not finding it easy to do the clarification job well. For example, fine dirt in synthetic-fiber poly-

mer solutions and melts can cause breaks during spinning. Although most plants manage by using some closely guarded system, there's frank admission that no filter on the market does the job completely satisfactorily.

This is not to condemn filter element producers. The melts and solutions are often viscous, cause high pressure drops across the filter media even at high temperatures. This has ruled out cloth filter elements in some instances. And metals are expensive, can't always be cleaned properly when they plug.

The situation in another CPI industry points up the problem of finding a proper element. Paintmaking requires what is often called selective filtration or straining. Finely suspended pigments must pass through the filter element, and agglomerates trapped. Techniques still aren't sophisticated, depend on plant trial-and-error. "And, sometimes one type of filter element will work well for a while, then suddenly won't do the job," says one paintmaker.

**Fine Measurements:** The basic problem of designing for clarification

is less complex than designing for cake filtration, in one sense—filtering takes place mainly through the filter element rather than through the cake that builds up on the element (*CW*, Jan. 2, p. 41). But because the amount of solids in the liquid is small (usually less than 0.1%) and the particles are in the low-micron-size range, clarification test measurements are difficult to make.

Recently developed test devices are simplifying clarification measurement formerly done only by physically counting with an ordinary microscope. Flying-spot microscopes, available from England, are used to simplify the job; but they cost in the neighborhood of \$25,000. Coulter electronic particle-size counters (Coulter Industrial Sales Co., Elmhurst, Ill.), originally developed for counting red and white blood cells, have been adopted recently for industrial use, have cut the measurement-device cost to the \$4,000 range.

Nonetheless, standardization remains a problem. Process company buyers complain that some filter element makers claim their elements will

## Unusual dibasic acid spurs research in

- polymers
- polyesters
- epoxy, alkyd resins

Dimer acid, in constantly increasing production by Emery Industries, Inc., is one of the most intriguing materials to come out of the fatty acid field in quite some time. Already, dimer acid has inspired over 160 use patents in the realms of resins, polymers, polyesters and other chemical intermediates. And, according to industry experts, these achievements just barely scratch the surface of the potential represented by dimer's unique structure, surprisingly low cost and ready availability.

Empol 1022 is Emery's "standard" mixture of dimer and trimer acid, approximately 3 to 1 respectively. Other proportions are available on a development basis.

Dimer acid is a *liquid*—with a high molecular weight of 578 (36 carbon atoms) as compared to other common dibasic acids. As the name indicates, trimer acid is tribasic and has a molecular weight of approximately 850 (54 carbon atoms), yet it too is a liquid.

These unusual characteristics bring many interesting applications to mind. For example, in polyesters, epoxy finishes, urethanes, elastomers, foams, alkyds and related products, the ability of dibasic acids to form polymers is of prime importance. In combination with alcohols and polyols, dimer acid produces interesting esters that may find use as plasticizers and hydraulic fluid additives. And, because dimer acid will react much the same as monobasic acids such as oleic and stearic, dimer acid also enlarges the possibilities for unique soaps, metallic soaps and condensation products.

In addition to all this creative potential of Empol 1022, its tankcar price of 26¢ offers strong commercial inducements in comparison with other relatively expensive dibasic acids.

Emery Industries will gladly furnish samples on request. And, for additional information, you can write for the Emeryfacts titled "Empol 1022" and Technical Bulletin #412 containing abstracts of use patents. Write Emery Industries, Dept. I-1B, Carew Tower, Cincinnati 2, Ohio.

## PRODUCTION

trap particles of a certain micron size but don't tell how tests or measurements are made. American Felt—a newcomer to the filter element field—often uses fly ash particles but points out that this gives only a good indication of performance; final tests must be run using the actual particles in the plant process stream.

**Leadership Overseas:** The British seem to be ahead in test standardization, have both military and industrial standards. Chemical company equipment specialists say that although some military standards have been set up in this country, they are in a constant state of revision, don't often help industrial buyers.

A major problem in standardization, say filter makers, lies in keeping testing devices clean. For example, if particles are trapped on a standard filter for measurement, contamination on the filter before testing must be subtracted from the final contamination. If the standard is off—and the filter is hard to get clean—results mean little.

Moreover, as the Bendix Filter Division of Bendix Aviation Corp. (Madison Heights, Mich.) says, filter elements "behave differently under varying conditions. It uses an electronically controlled shake table to simulate operating conditions of fluid systems (particularly in missiles), assure accuracy of filter rating. And, Bendix says, filtration results are different from those obtained if the filter is stationary.

**Propellant Boost:** Many of the techniques researched by companies like Bendix for filtration of 2-5-micron-size particles are already accepted as being the best tests for filter elements in chemical plants making hydraulic fluids and rocket propellents. They might be put to more general chemical plant use. The problem here is that such tests are costly, making filters of guaranteed quality expensive.

In propellant filtration, absolute cleanliness is essential. Here, the use of porous metal filters that trap particles of a given size are justified. But these often cost \$150-200/sq. ft., can't be justified in ordinary chemical operations. And, although the metal filters can be cleaned, re-used, there is always the problem of corrosion resistance—particularly in chemical processes where operating conditions often promote corrosion.

For these reasons, nonwoven fabrics are usually most economical. Since they have no woven threads and are of greater thickness, they won't "blind," as do cloths normally used for cake filtration. And they are usually less expensive than woven fabrics, can economically be thrown away without cleaning.

**Fiber Filter Lineup:** Some of the nonwovens are bonded with regenerated cellulose or thermoplastic resins, resemble paper. In fact, pulp sheets are used for some chemical filtering operations.

Alsop Engineering Corp. (Milldale, Conn.) has offered cellulose and asbestos mixtures for many years. They are relatively expensive, are usually used for "high-polishing" jobs such as are required by drugmakers.

Wool felts have found wide acceptance for oil clarification. The felts are made by gently oscillating warm, moist fibers under conditions that cause their fish-scale-like surfaces to lock together. Synthetic fibers have smooth surfaces, but when they are punctured with a needle, they can be interlocked mechanically to form felts.

The synthetic-fiber felts have expanded felt usage, often in the form of resin-bonded cartridges. Cuno Engineering Corp. (Meriden, Conn.) and Commercial Filters Corp. (Melrose, Mass.) offer cartridges that are probably in widest use (most often in the paint industry). American Felt has entered the field with a cartridge claimed to have longer life and to operate at lower pressure drops. Key: edge-wise liquid flow, where the liquid enters the fabric around the ends of the fibers, flows in the direction in which the fibers lie, rather than across the fibers, as in most cartridges. The volume of flow is greater and particles are said to penetrate deeper into the filter before they are trapped, thus increasing filter capacity.

**Depth Filtration:** Clarification filters operate on the depth-filtration principle long used by sand-bed filters for water clarification. The filtering action takes place within the filter medium rather than at the surface. But just how the particles are trapped, why they are not re-entrained in the fluid, and how liquid properties such as viscosity affect the filtration process haven't been well defined.

In general, as viscosity increases,



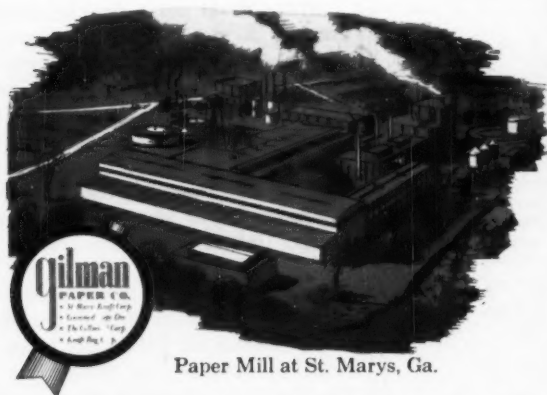
*"It wasn't there last year!"*

This is the new 300,000 sq. ft. addition to Kraft Bag Corporation's converting plant at St. Marys, Georgia, scheduled to go "on stream" in February.

Here, in one giant integrated operation, logs from our own forest lands are turned into pulp, then into paper, and finally into heavy duty multiwall shipping sacks, using the most modern machinery and equipment the industry affords.

This expansion of our facilities is one more step in our constant efforts to provide our customers with the best in quality and service.

*We invite your inquiries.*



Paper Mill at St. Marys, Ga.

## **KRAFT BAG CORPORATION**

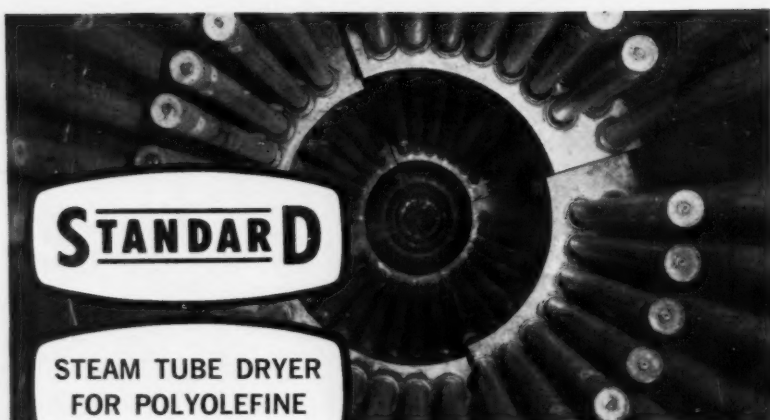
Gilman Paper Company Subsidiary

**630 Fifth Avenue, New York 20, N. Y.**

**Daily News Building, Chicago 6, Ill.**







**STANDARD**

**STEAM TUBE DRYER  
FOR POLYOLEFINE**

*Interior view during construction.*

With high thermal efficiency, **STANDARD** Steam Tube rotary dryers are now on the job processing polyolefine in a new Gulf Coast plant. The two 65' x 6' dryers have stainless steel tubes and stainless clad shells.

Developing vapor seals of top efficiency and pioneering the manufacture of all-welded aluminum Steam Tube dryers, **STANDARD** has made many important contributions to the science of rotary drying.

For the best in rotary dryers and helpful engineering advice, contact the nearest **STANDARD** office.

## STANDARD STEEL CORPORATION

General Office & Plant: 5010 Boyle Avenue, Los Angeles 58, California

Eastern Division — Office & Plant:

CAMBRIDGE COMPANY Lowell 10, Mass.

Midwest Division — Office & Plant:

LEADER IRON WORKS Decatur 10, Ill.

ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS • CRYOGENICS

## 4,4'-DIAMINO DIPHENYL SULFONE

a new curing agent  
for epoxy resins  
with excellent structural  
properties at  
elevated temperatures

# EPORAL®

(4,4'-Diaminodiphenyl Sulfone)

Available from stock  
in New York

Write for information  
and samples

**ROUSSEL CORPORATION**  
155 East 44th St., New York 17, N. Y.  
OXford 7-5820

**ARAPAHOE**  
TRADE MARK

## GRIGNARD REAGENTS & GRIGNARD REACTIONS

Over 12 years experience with the commercial production, sale and shipment of **GRIGNARD REAGENTS** is concentrated only at **ARAPAHOE**. Regularly produced and stocked are 7 different **GRIGNARD REAGENTS** in ethyl ether, and these or other Grignards are supplied in special solvents on custom order. Used in hormone, vitamin, drug, insecticide and other industries... some selling for less than \$1/lb. of solution.

If you're not equipped to use these highly reactive, stable intermediates, why not have us perform the **GRIGNARD REACTION** for you on a custom basis?

## CUSTOM SERVICES

We specialize in producing organic compounds, intermediates (used in making hormones, vitamins, etc.) and semi-finished drugs, insecticides and pesticides on a volume basis.

Don't spend for plant until you are sure. It's better to hire us as many of our satisfied customers do. Want their names? Write Dept. "A".

Sales Agents in NYC, Chicago, San Francisco, Mexico City, Basle, Milan and Brussels

**ARAPAHOE CHEMICALS, INC.**  
2800 PEARL STREET • BOULDER, COLORADO  
PRODUCERS OF FINE ORGANIC CHEMICALS

## PRODUCTION

particle retention is not as great. But even in sand-bed filters, mechanisms are still under study using techniques such as radioactive tracers. If experience with sand-bed filters is an indication, makers of clarification filters have a long research trail ahead. But with the push from the military, and the development of new testing techniques, they show signs of making progress.

## EQUIPMENT

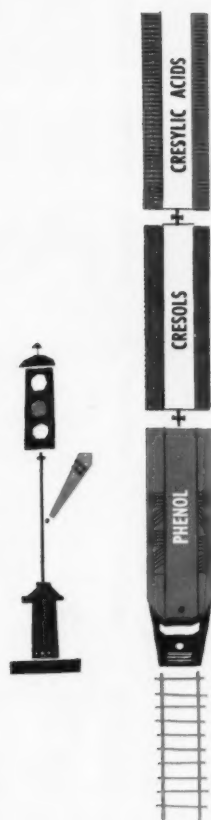
**Solids Valve:** A new gum-rubber diaphragm-type discharge valve for coarse, abrasive, odd-shaped materials (e.g., catalysts and pellets) that are unable to pass through conventional rotary valves is now available from U.S. Hoffman Machinery Corp. (103 Fourth Ave., New York 3). The valve's two opposing diaphragms are opened and closed by air pressure (or vacuum) to discharge materials in measured quantities. Should one diaphragm rupture, the other can maintain an air-tight seal, prevent uncontrolled flow.

**Nylon Hose:** The Polymer Corp. (Reading, Pa.) is marketing a new, lightweight, nylon pressure hose that resists fatigue, fungus, caustics, most organic solvents, mineral acids below 5% concentration. The hose, available for operating pressures of 1,250 and 2,000 psi., is 20% the weight of equivalent-strength rubber hose. A nonconductor, it may be used in high-voltage areas.

**Motor Protector:** A limiting device for use with compressor pneumatic control systems provides protection against motor overload. It's a new offering of Johnson Service Co. (Milwaukee, Wis.). The R-27 limiting relay regulates demand of the pneumatic inlet valves to maintain predetermined motor current at any value between 40 and 100% of maximum.

**Particle Counter:** Royco Instruments Inc. (Mountain View, Calif.) offers a counter for continuous monitoring of outdoor and indoor dust. The record is presented on a strip chart divided into 15 ranges from 0.3 microns to any desired upper limit. The instrument counts particles at a rate of 1,000/minute, is self-calibrating.



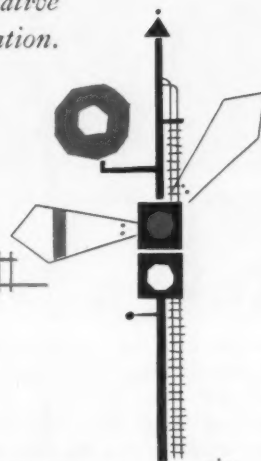


JUST A FEW OF THE  
*Basic Chemicals*

available from

**REILLY'S**  
*10 strategically placed plants*

*Write so that the Reilly representative  
nearest you may give you information.*



*Send for the Reilly Chemical Index.*



**REILLY TAR & CHEMICAL CORPORATION**

MERCHANTS BANK BUILDING  
INDIANAPOLIS 4, INDIANA

Sales Offices in Principal Cities



Giving full attention to exhibit, visitors to recent New York Chemshow receive the full impact of

## Take a Critical Look at Your Trade-Show

Within the next few weeks, many chemical process industries marketing directors and sales managers will start thinking about their upcoming trade-show exhibits. And the odds are—based on previous experience—that their thinking will often reflect a frightening lack of trade-show know-how, result in the waste of thousands of promotional dollars.

This is the consensus of trade-show managers, who agree that most companies make costly mistakes in planning and executing exhibits. Earl Stevens, president of International Exposition Co. and manager of the recent Exposition of Chemical Industries, tells *CHEMICAL WEEK*, "A trade show is a major expenditure for most companies. There's great excitement 12 to 14 months before the show, when the decision is made to enter it. Afterwards, everyone gets so darn busy with other things that nothing

is done until a month before the show opens. Results: a poorly planned exhibit, overtime pay for workers who install the equipment."

The tendency to forget about trade-show participation until the last minute isn't the only problem facing the CPI exhibitor, observers note: "Most exhibitors seem to go into a trade show unsure of what they're trying to accomplish. There's too much 'what do we want to sell?' and not enough 'who do we want to see and how do we get him into our booth?'"

To overcome the narrow "product selling" attitude and to get the most for his money, an exhibitor, say the experts, should:

- Develop a trade-show strategy that takes into consideration whether his goal is to attract a great deal of traffic or to persuade specific customers and prospects to visit the booth. This is important in determin-

ing the size and location of the booth, equipment to be displayed, layout and personnel.

- Employ a "stage" design for his booth. Most trade-show booths are conceived and laid out without regard to the proved facts that lighting, grouping of salesmen, the three-dimensional arrangement of elements and other factors play an important part in attracting and holding visitors.

- Be prepared to coordinate advertising, promotion and publicity with the exhibit. Promote the exhibit with preshow publicity, follow up with reprints to those who visit the booth.

- Feature new products and ideas, have publicity on hand for visitors and the press.

**Using Outside Help:** Realistically, the job of planning and preparing for a trade show often requires more time and effort than many companies can afford. Using an agency—the us-

◀ To capture this audience

... avoid these pitfalls ▼



Sparsely equipped booth gives feeling of more theory than practice.

Overcrowded booth, teeming with salesmen, can frighten away prospects.



equipment manufacturer's message.

## Technique

ual approach for advertising in magazines, newspapers, and other media—is often the answer for trade shows, too.

In addition to helping its clients plan their exhibits and coordinate their advertising and promotion, an agency often provides additional services. For example, O. S. Tyson and Co. provided the following for its nine Chemshow clients:

- The OST Newsletter, intended as a guide for salesmen, particularly those from out of town. It contained recommendations for entertainment, dining, where to stay, how to get around the city.

- A USO-type center to provide salesmen with theater and TV tickets, reservations, etc.

- Publicity assistance to provide special information and coverage for the press. This is significant, since most exhibitors ignored the pressroom. Few

talked to pressroom personnel, provided special items, or suggested story ideas.

- Company-image and competitors'-booths surveys for several clients.

- "G-2" service, consisting of visits to client and competitor booths to observe sales pitches, booth layouts, equipment, etc.

**Revealing Surveys:** The surveys were beneficial at the time, hold even more significance for future shows. The company-image survey, for example, revealed that lack of equipment in an exhibit and overuse of diagrams gave visitors the impression that the company dealt in theory rather than in practice, that it was a small, ultraconservative firm lacking definite marketing aims, that it lacked enthusiasm for its products.

The use of a "school-house" motif by one company gave visitors the impression that the company had imagi-

nation and an appreciation for the importance of capturing the prospects' attention and respect, that it wasn't afraid to use "gimmicks," and that it was willing to spend money to make money.

A firm that painted its equipment white for the show ended up with a "hospital-room" atmosphere, presented a dull, unimaginative, sterile image. Another company that had an ill-kept exhibit created the image of a slipshod firm that was likely to do low-quality work.

The survey of traffic conditions at competitors' exhibits brought forth revealing "do's" and "don'ts" for exhibitors. The survey showed, for example, that it's a mistake to try to overpower a prospect with a garish or noisy and overlighted display. Instead, one should try to slow him down a bit so he'll take a second look.

Conversely, a dimly lit booth most



likely will be passed by because the visitors don't even see it.

Too many salesmen standing around are certain to frighten away the prospect who dislikes being pounced upon. Along the same lines, too much equipment gives the visitor the impression of overcrowdedness, causes him to pass along to another booth.

Watch out, the survey warned, for the homey, "living-room" atmosphere. This sort of exhibit is likely to make the prospect feel that he's intruding on something private.

And finally, it was found that booths with too much diversification of display were a severe handicap, once the prospect was in the booth. Some diversification of equipment proved good, but too much kept the visitor from concentrating on any single item.

Trade-show participation, like any other facet of today's marketing, is becoming more competitive. Dozens of firms are fighting for the prospects' time and money. Logically, the best job gets the best result. To do the best job, CPI exhibitors might well take the advice of one trained showman:

"Decide early what you want to accomplish at the show, what equipment you want to put in your booth; then establish a schedule for building, shipping and installing—and stick to it."

Stevens puts it this way, "I can't tell you how many times we have to follow up to get exhibitors' product breakdowns so we can classify them in our show directory; and it's like pulling teeth to get many firms to submit press releases and to fill out badge request forms."

A good exhibit is a valuable promotional tool; a poorly planned, poorly manned exhibit is a waste of money.

## Ore Car Debuts

Within the next few weeks, Western ore producers will help field-test a new railroad gondola car specially designed to solve two of their toughest shipping problems — high in-transit losses, and severe unloading difficulties.

The car—built by Philadelphia-based Baldwin-Lima-Hamilton Corp.—will undergo a series of tests involving copper ores and concentrates,

bauxite, wood chips, and possibly other materials.

If successful, the new car could become popular with ore producers, get a thorough inspection by chemical shippers.

Ore and concentrate losses often run as high as 1,000 lbs./car. To reduce losses, many shippers now line their car doors with cardboard—a slow, costly, and often ineffective, operation. Moreover, the cars must be idled for a full day on a siding to complete this job.

Unloading causes even more trouble. After remaining in the car for three or four days (average trip is over 100 miles), wet materials often dry completely, form cementlike blocks of material. Generally, four to six men are needed to loosen the hardened product with pneumatic drills before it will flow into the smelter storage bins.

In extreme cases, vibrators and clam-shell buckets are needed to empty the cars. After them, one or two men often spend a few hours shoveling and sweeping out the last of the ore.

Considering the expense involved in all these operations, it's not difficult to understand why ore producers would welcome a cheaper, simpler operation.

**New Features:** To solve these problems, B-L-H began studying the problem about a year ago, came up with a car design involving these features:

- Car sides that slant outward toward the bottom, allowing the entire contents to dump out in one motion.
- Special, nonstick coatings (B-L-H was mum on the exact nature) to prevent lay-up of material.
- Special spring-loaded steel doors designed to close with positive pressure, minimizing leakage. Rubber seals on the inside also add protection.

B-L-H told CHEMICAL WEEK the new, 88-ton, 950-cu.ft. capacity cars will be available about four months from date of order, added that it preferred to sell the cars rather than lease them.

If all goes well in the coming weeks, B-L-H figures it may sell 300 of the cars in the Far West, possibly more in other parts of the U.S. No doubt, CPI shippers will watch the tests closely, particularly those shipping nonhygroscopic solids.

## DATA DIGEST

• **Radiochemicals:** Twenty-page catalog gives prices and shipping data on radioactive compounds, radiation sources, radioactivity standards, and radiation source kits. Among the radiochemicals: 38 new tritium compounds, besides hundreds of carbon-14, sulfur-35 and phosphorus-32 labeled compounds. Nuclear-Chicago Corp. (Des Plaines, Ill.).

• **Surfactants:** Color-illustrated booklet discusses applications of Igepal surfactants in pulp and paper industries. Uses of four surface-active agents in cooking, washing, deresination, bleaching, other paper processing operations are included, plus brief outline of chemical properties. General Aniline & Film Corp. (General Dyestuff Co., New York).

• **Acid Handling:** Three new technical bulletins describe bulk-handling and storage procedures for sulfuric acid and oleum (I-182), chlorosulfonic acid (I-181) and muriatic acid (I-183). Subjects covered include: product sampling methods, safety factors, construction materials, fittings for tank-car domes and tank-truck piping, and methods of indicating level. Monsanto Chemical Co. (Inorganic Chemicals Division, St. Louis).

• **Itaconic Acid:** Detailed product bulletin discusses properties and uses of itaconic acid and its dimethyl and dibutyl esters. Extensive treatment is given to polymerizations—both homopolymerizations and copolymerizations involving acids, acrylates, methacrylates, acrylonitrile, butadiene, styrene and vinylidene chloride. Storage, handling and toxicology are also described. Chas. Pfizer & Co. (Brooklyn).

• **Product Index:** New catalog furnishes property, use and price information on company's lines of intermediates, solvents, plasticizers, cellulose, and gasoline additives. Celanese Chemical Co. (New York).

• **Cryolite:** Illustrated 24-page booklet reviews history and mineralogy of cryolite, gives data on physical and chemical properties, current and suggested applications, and discusses its role in abrasives, insecticides, and various metallurgical uses. Bibliography and a series of phase diagrams are also included. Industrial Chemicals Division, Pennsalt Chemicals Corp. (Philadelphia).



You're right  
at the top with

**BRYTON**

BARIUM SULFONATES

CALCIUM SULFONATES

AMMONIUM SULFONATES

NATURAL SODIUM SULFONATES

SYNTHETIC SODIUM SULFONATES

SULFONIC ACIDS

...because Bryton is the producer of  
the world's most diversified line  
of oil-soluble sulfonates

Bryton has the specific sulfonate for you. Our ability to overbase alkaline earth sulfonates plus an improved sulfonation process assure a diversified series of sulfonates of uniform quality. Bryton's research laboratories, developers of HYBASE® Barium Sulfonate (65 Base Number), carry on a continuous program to develop new and improved products.

By calling on Bryton to answer your sulfonate requirements, you avail yourself of our broad experience and know-how to serve you better.

For additional information, write to:  
Bryton Chemical Co., Att. Mr. A. C. Kellerman  
1270 Ave. of the Americas, New York 20, N. Y.  
European Address: P.O. Box 1207, Rotterdam, The Netherlands



© 1960, Bryton Chemical Company



EXPANSION JOINTS

# THEY STAY FLEXIBLE when handling the most severe chemicals

"U.S." Expansion Joints of  
butyl rubber construction are recommended  
for handling certain chemicals.

Typical of these are:

**ANILINE-R.T.**

**DIETHYL SEBACATE-R.T.**

**HYDROCHLORIC ACID (37%) UP TO 122° F**

**SODIUM HYDROXIDE (20-50%) UP TO 158° F**

**SODIUM HYPOCHLORITE (20%) UP TO 158° F**

**SULFURIC ACID (50%) AT R.T.**

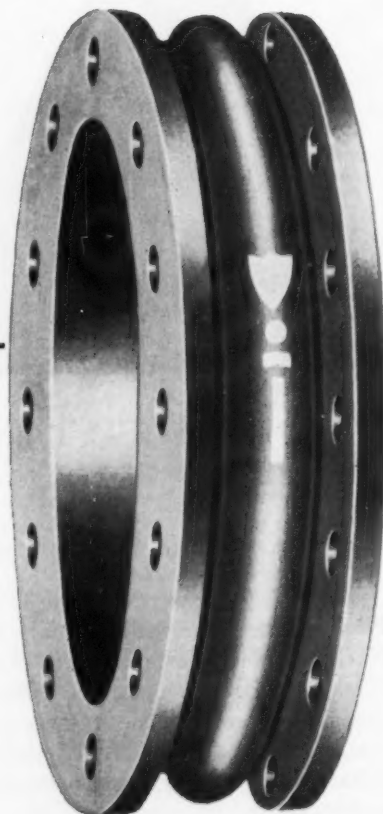
"U.S." Expansion Joints remain completely flexible at all times. Joints made of neoprene or natural rubber stiffen up, crack and fail when handling the above chemicals.

For the most severe service, specify "U.S." Expansion Joints lined with Teflon. These "U.S." Joints are ideal for handling most chemicals and solvents.

"U.S." Expansion Joints are in use in every kind of industry. Some of these joints have been on the job since 1924, the year "U.S." invented them! Long-lived, they *prolong the life of equipment* in pressure and vacuum systems.

• • •

When you think of rubber, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery, and quality industrial rubber products.



Mechanical Goods Division

## United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.

# Technology

## Newsletter

CHEMICAL WEEK  
January 30, 1960

**An electric-arc process for synthesizing acetylene from methane,** using alternating current, has been developed in Czechoslovakia. Operating costs are said to be 15% lower than direct-current arc devices; yields, slightly higher (58% for ac. arc vs. 40-50% for dc. arc). Key to higher yield is the quenching system for cooling product gas. After passing through a hollow, water-cooled copper electrode and through the arc, the gas is cooled by saturated hydrocarbons (e.g., gasoline). At this time, part of this cooling medium is converted into unsaturated compounds—mainly ethylene—thereby increasing total energy and material balance. The Czech scientists claim that the new method is less costly than any other acetylene process.

**Auto fuel composition changes, designed to help clear up smog,** are due in Los Angeles after June 30, according to Leslie Chambers, director of research, Los Angeles Air Pollution Control District. Test data show that "reduction of gasoline olefin content to a 10-12.5% maximum would reduce the carbon-4 olefins in [auto] exhaust by about 45%," says Chambers. Cost to the average motorist will be \$10-\$15/year, based on refinery estimates of a 2¢/gal. increase in the gasoline price.

Fuel-exhaust relationships are being studied at the district's labs, the Public Health Service Laboratories in Cincinnati, The Bureau of Mines Experiment Station in Bartlesville, Okla., and participating West Coast refineries.

**"Molecular electronic" devices,** a thousandth the size of comparable transistorized circuits, were displayed in Washington last week at an open meeting of Westinghouse and Air Force researchers. Based on conventional semiconductor materials (e.g., silicon, germanium, inter-metallics), each device performs a function, such as amplification, that normally requires multiple electronic components.

The crystals required are grown by a new continuous method (*CW Technology Newsletter*, Aug. 8, '59). Applying new basic knowledge about semiconductor behavior, Westinghouse uses individual crystals to duplicate the effect of a circuit. First applications are expected in three to five years, in space equipment.

**Purzaust, a catalytic auto muffler** developed by Universal Oil Products (Des Plaines, Ill.), can control exhaust within California's recommended limits for smog control, the firm's senior vice-president, R. E. Sutherland, said last week. He told the California Senate Committee on Public Health and Safety that the cost of installing Purzaust is "not more than \$50 higher than the price of a conventional muffler." The unit silences as well as the latter, won't increase floorboard temperatures, he said.

# Technology

## Newsletter

(Continued)

**A 36% hike in funds for space propulsion research** and development has been budgeted by National Aeronautics and Space Administration. NASA is asking for \$60.8 million, compared with \$44.8 million in the current fiscal year. Budgeted outlay: solid-fueled rockets, \$2.8 million; liquid rockets, \$40 million; nuclear propulsion, \$10 million; space power technology, \$8 million.

•  
**Large-scale tests of live-virus polio vaccines** are beginning in the U.S. Success could mean commercial production within one or two years. Merck is making the vaccine (developed by Dr. Albert Sabin at the University of Cincinnati) for tests in Houston, Cleveland, and New Haven, Conn. Lederle vaccine is getting a tryout in Miami.

The new vaccines, administered as a cherry-flavored liquid or hard candy, have been tested on 12 million people in Russia and others in Latin America and the Far East. But the U.S. Public Health Service has been unwilling to license commercial production until further tests are carried out with stricter controls than those used abroad.

•  
**Tretamine (a nitrogen mustard)** looks promising against inoperable lung cancer, according to Gordon Jack, department of thoracic surgery, Baguley Hospital (Wythenshawe, Manchester, England). Preliminary trials of the new drug involved 43 patients, 30 of whom show improvement. Complete regression of the tumor has occurred in 10 cases; but how long remission lasts is not yet known. The drug is nonselective—toxic to normal as well as malignant cells—but side effects can be controlled using prednisolone and penicillin.

•  
**Superconductors are the target of intensive cryogenic research** unveiled last week in General Electric Co.'s general engineering laboratory. Superconductivity is an ultralow-temperature phenomenon exhibited by about 20 metals (e.g., mercury, lead, tin, columbium, tantalum) and many compounds and alloys. At temperatures close to absolute zero, these materials have no electrical resistance, can carry electric current almost indefinitely without losses and resist penetration by magnetic fields. These characteristics are employed in a high-accuracy cryogenic gyroscope now being developed by GE under contract with the Army Ballistic Missile Agency. Key: a golf-ball-size rotor of superconductive columbium, spinning at 20,000 rpm. on magnetic "bearings", eliminates random errors which are inherent in conventionally designed gyros.

Dr. T. A. Buchhold, who conceived the cryo gyro, suggested numerous other potential applications of superconductors, including magnetic lenses which may enable an electron microscope to resolve individual atoms. What's needed now, says GE's engineering lab manager, James Young, is more research on superconductors to learn what determines their unusual characteristics and how superconductivity can be controlled or produced in other materials.



# Newest from National Lead Research... INVIN\* 85

unique, balanced stabilizer  
especially developed to:

1

## Make better plastisols

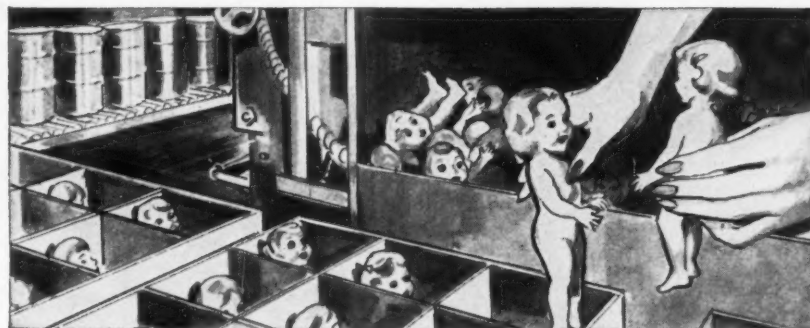
- New lows in initial viscosity
- Minimum buildup of viscosity on aging
- Improved air release



2

## Make better finished products

- New highs in heat and light stability
- High resistance to sulfide staining



## National Lead chemical research improves performance of many other vinyl products

National Lead chemical research develops stabilizers to improve all commercial vinyls. There are special stabilizers designed for electrical insulation, garden hose, stereo records, floor tile, strip-coatings, upholstery sheeting, shower curtains. National Lead also has gelling agents which control sag, run-

off and fabric penetration of plastisols, organosols.

For more about INVIN 85 stabilizer and other chemical developments from National Lead Company, check and mail coupon below. Technical help in their application is yours on request.

.....  
**NATIONAL LEAD COMPANY**, 111 Broadway, New York 6, N. Y. • **In Canada:** Canadian Titanium Pigments Limited KO-8439-W  
1401 McGill College Ave., Montreal

Gentlemen: Please send literature checked below on the chemicals developed by National Lead Research.

### ● Folders on Stabilizers:

- ☐ On INVIN\* 85 stabilizer  
☐ On stabilizers for other vinyl products

(specify) \_\_\_\_\_

### ● Folders on Gelling Agents:

- ☐ For gelling plastisols, organosols

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

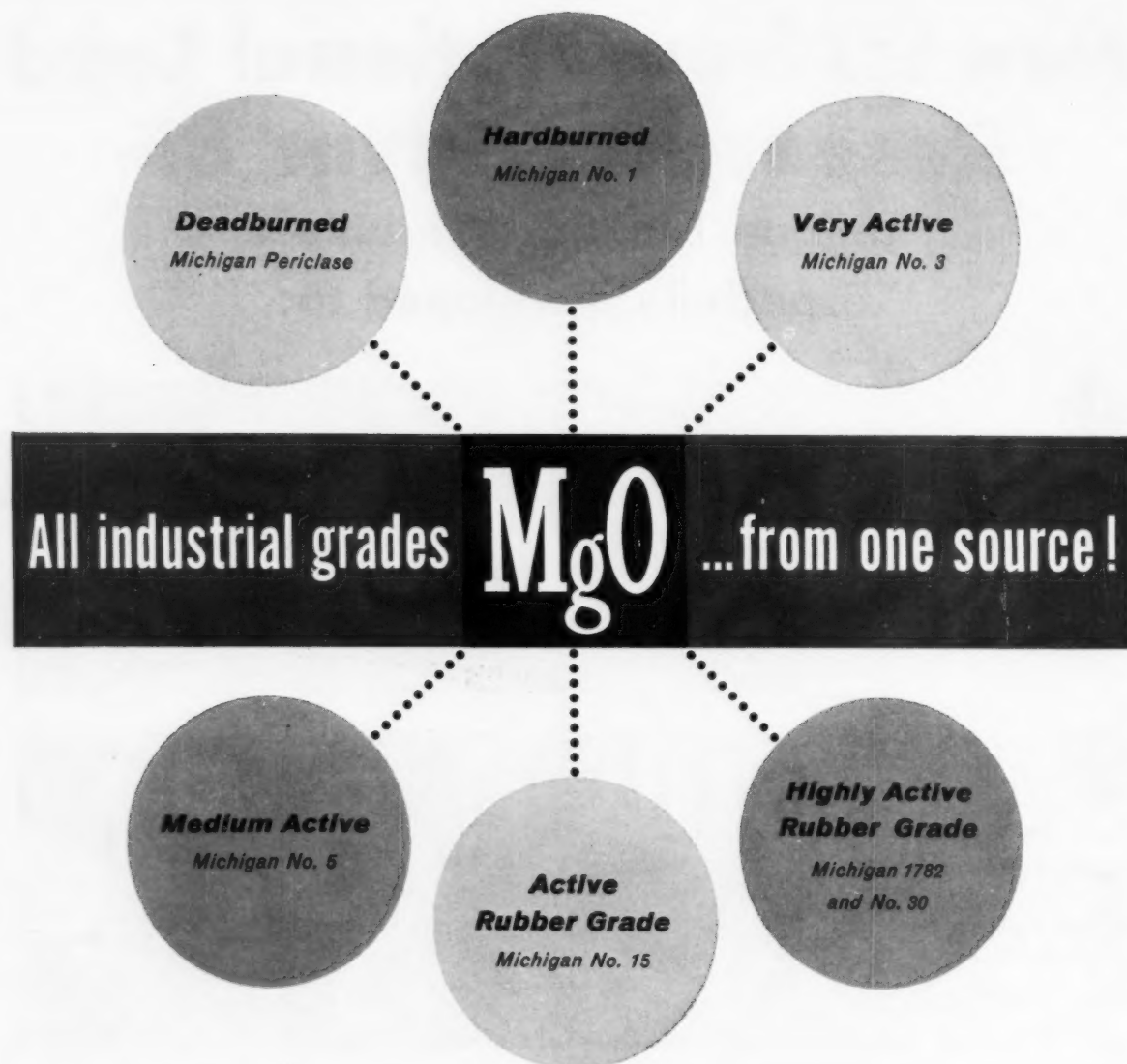
\*TRADEMARK

A Chemical Development

of **National Lead Company**

111 Broadway, New York 6, N. Y.





**With operations underway** at Michigan Chemical's new seawater magnesia plant at Port St. Joe, Florida and continuing production at our Saint Louis, Michigan plant, users can secure all grades of  $MgO$  from one company source.

If you use Magnesium Oxide, you now have a larger and wider source of supply in Michigan Chemical Corporation. Our new seawater plant at Port St. Joe, Florida is now producing a high-purity periclase grade, as well as other active grades of magnesia, complementing our long-established facilities at Saint Louis, Michigan.

These two plants together offer a complete series in industrial magnesia products, serving the refractory, insulation, construction board, textile, rubber and chemical industries, plus many others.

Dependable deliveries from both plants. At Port St. Joe there is access to rail, motor, Mississippi River barge, and ocean transport facilities; Saint Louis is served by railroad and truck lines.

Your inquiry about magnesium oxide will receive prompt reply. Write or phone Magnesia Sales Division, Michigan Chemical Corporation, Saint Louis, Michigan.

*Suggestion to large quantity users: Investigate the available plant sites adjacent to our Port St. Joe plant.*

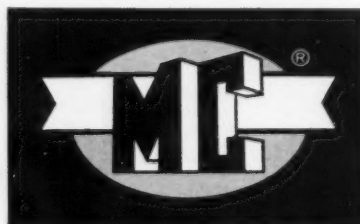
*For complete listing of Michigan Chemical products, see your Chemical Materials Catalog.*

## MICHIGAN CHEMICAL CORPORATION

677 North Bankson Street, Saint Louis, Michigan

EASTERN SALES OFFICE: 230 Park Avenue, New York 17, New York

Copyright 1960 Michigan Chemical Corporation



M-60-1

# ADMINISTRATION

## Salesman for Civic Action

Despite recent decisions by chemical companies that they'll take increasingly active parts in civic affairs and politics, many management men are still groping for ways to make such programs really effective. One possible way may be along lines of Monsanto Chemical's Business Climate Committees.

In St. Louis, this week, Monsanto's director of civic affairs, Thomas Diviney, is preparing his year-end report on the operation of 17 such committees, one in every state in which Monsanto has a major producing location. The reports show how these groups have begun a wide variety of activities designed to promote the social, economic and political well-being of Monsanto, its neighbors, employees, customers and share-owners.

Monsanto's committees are only one segment in its over-all civic affairs program, but they are important because they are also the means by which much of the rest of the program is implemented. They act as a local outlet, and initiator, for civic and political projects.

To show how they operate, Diviney puts them in the context of his whole program, which took formal status last spring when he was appointed director, after a year of policy formulation by top Monsanto management.

Diviney operates in a staff function, within lines of policy laid down by the Government Affairs Policy Committee that reports to the company's executive committee. Besides himself, the policy committee includes three vice-presidents and the company's general counsel. Diviney's recommendations, after approval by all concerned, go to operating department general managers who effectuate them, also appoint the "climate committees" made up of local plant or division management.

The over-all program has many segments—a good many of them in operation, or nearly so. In addition to institution of the climate committees, active projects include:

- Initiation of political action courses for employees.
- Organization of a program to keep track of—and take action on—

tariff matters of interest to the company.

- Dissemination of nonpartisan information on current affairs that affect the company, along with separate exposition of the company's point of view. Such publicity also urges employees to make up their own minds and take whatever action they see fit.

- Cooperation with other employers in the area of business climate improvement.

- Publication of a legislative bulletin—the first issue is in the works—describing legislative proposals of significance to the company. Diviney reports a number of other segments under study. These include such things as amendment of the company's tuition payment program to include courses in political science; revision of the employee appraisal program to recognize civic affairs as an area of employee activity; and establishment of an employee recognition program that would set up special awards for outstanding civic activity.

**Dissemination:** It's these programs that the Business Climate Committees assist in implementing. Some, of course, are more suited to Diviney's office, but many are more effective when carried out at local levels. In fact, Diviney reports, one U. S. senator told a Monsanto plant manager that it's virtually impossible for him to be fully informed about all the issues he must vote on, and discussions with businessmen give him a welcome chance to learn business' points of view. And, adds Diviney, it's far more effective for such discussions to arise on a politician's home ground than at company headquarters.

The committees have already been active, some of them ahead of schedules originally proposed. Some highlights from committees' reports:

- Anniston, Ala.—All 61 salaried employees have participated in a practical politics course, along with 111 hourly paid employees. Management has talked with local and state congressmen, was instrumental in working out a compromise that cut by 50% a proposal to increase state use taxes.
- Nitro, W. Va.—Conducted an audit of employees active in civic



Diviney: 'Local action means more than headquarters pronouncements.'



'No program can work without full backing of corporate management.'



'Reports from state committees are evidence of interest and effect.'



## ADMINISTRATION

affairs (including a mayor, a fire chief, a police commissioner, a sanitation commissioner and four councilmen, among others). Helped to quash a law that would have banned the use of polyethylene bags.

- Columbia, Tenn. — Arranged for talks by politicians before a mid-management seminar.

- Luling, La.—Arranged for in-plant voting registration; lunched with prominent U. S. senators to discuss fertilizer co-ops and tariff matters.

- Denver, Colo.—Management of Monsanto's Lion Oil division has kept close tabs on discussions of proposals to increase federal oil and gas lease rentals.

- Texas City, Tex.—Plant publications won a 1959 Benjamin Franklin Award from the Texas Manufacturers Assn. for a "continuous program of discussing vital issues of an economic, political and labor-management nature." Management also aired, through the publications, both sides of a proposal by the city to issue bonds for a sewerage system, described why it favored the proposal — on purely community welfare grounds, incidentally—and urged employees to vote as they saw fit. The once-defeated proposal won.

- Everett, Mass. — Committee members participated in a business climate survey that pinpointed some community shortcomings, helped initiate a program to remove them. Committee also worked against a legislative proposal that would have diverted employer contributions to unemployment compensation funds into relief for strikers.

**Sum Up:** Such examples of activity add up, Diviney believes, to strong evidence in favor of local action under corporate guidance. In each instance some form of his over-all program is being carried out—and more forms will be added as the need arises and circumstances permit.

Diviney reports that he's had no real problems in getting his program in operation. With full backing of management, and the personal endorsement of most general managers, he's found a ready acceptance of his proposals.

Monsanto makes no effort to cloak its program in terms of sheer altruism. Diviney comments, "We'd be kidding ourselves and the public if we said there is no selfish motive in all this."

Nevertheless, he believes, company and community have nearly parallel goals, and the achievement of those for one is sure to assist in their achievement for the other.

These consistent goals are why the climate committees can operate effectively in both the political area—working with politicians—and in the government affairs area—fostering more civic efforts by employees. And, if Diviney's hopes come true, look for these programs to continue to grow in importance and effectiveness.

**Measurements:** Gauging the results of such a program is difficult at best. However, two additional projects still in the formative stage may help here.

First is a companywide audit of civic and political activity by employees. This would not only serve as a numerical guide to be compared with future audits but would also reveal changing individual and regional interests.

Second is a legislative scorecard of how legislators vote on issues of importance to Monsanto. This may give clues as to the success of political efforts by company people.

Monsanto does not claim its program to be the best among those of process firms. But even a casual glance at the committee reports shows that the company has taken a significant step toward effective political action.

## State's New Smog Law

**As the state of Pennsylvania assumed control of air pollution, CPI plants there got the promise from the Keystone State health secretary, C. L. Wilbar, that the new air-pollution control law is not designed to "push industry to the wall financially."**

The new measure, just signed by Gov. D. L. Lawrence, creates an 11-member air-pollution control agency that will supervise the state's fight against air pollution in 65 counties that do not have countywide controls. The agency will include state secretaries of health, agriculture, labor and industry, mines and commerce; three appointees representing industry; a professional engineer; a toxicologist, and a representative of the public.

The bill also provides for establishment of regional air-pollution control associations, comprising at least

one member from each county participating. Members will be appointed by the governor.

Many Pennsylvania municipalities now have locally enforced smoke-control ordinances. But they are powerless to stop pollution drifting into their areas from neighboring localities. Whereas the state health department is aware of many of the sources of air pollution, its activities will be subject to direction from the commission.

**Clearing the Air:** Pollution problems will be solved by "persuasion and conciliation" and on a voluntary basis. Otherwise, the commission will enforce the new law through the state health department.

Under the measure, atmospheric pollution is subject to a summary fine of \$30 to \$300 or 10 to 30 days in jail for first or second offenses. Chronic violators could be fined from \$500 to \$1,000 and jailed up to one year. Governor Lawrence said he had recommended a stronger measure, but hailed the enacted bill as the first major step toward alleviation of what he called "one of Pennsylvania's major public health problems."

## Picking Up TV Tab

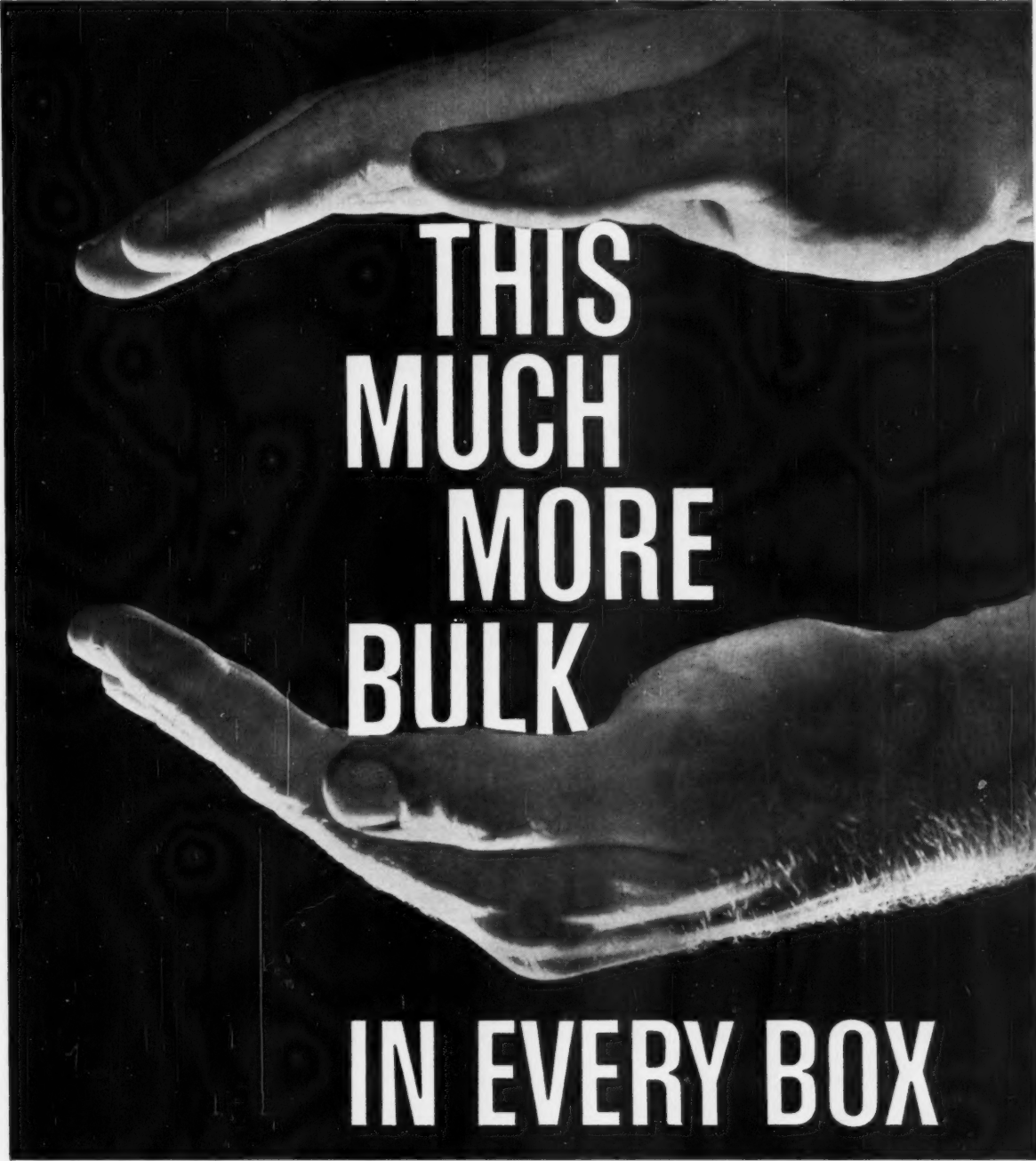
**Institutional advertising by CPI companies will get a boost next week when Standard Oil Co. of New Jersey takes over sponsorship of a dramatic, adult television program that had been unable to win substantial product sponsorship.**

The program, called "The Play of the Week," has in the past few weeks moved 28,000 viewers to write letters urging that it not be discontinued for lack of sponsorship. And already one goal of institutional advertising has been won: compliments and congratulations are pouring into the office of M. J. Rathbone, president of Jersey Standard, from hundreds of viewers.

As the name implies, the two-hour program presents top-name casts in a different play each week, often selected from theater classics. It had not attracted a program sponsor, although several advertisers had purchased spot commercial time.

**Hands Off:** Rathbone emphasized that, as sponsor, his company would apply the "hands-off policy that we have traditionally followed in our sponsorship of daily newscasts." At





# THIS MUCH MORE BULK

# IN EVERY BOX

**BUILD 30% MORE BULK INTO YOUR DETERGENTS  
WITHOUT INCREASING COST A WHIT**

Hooker spray-dried phosphates in your detergents give them up to 30% more bulk, depending on the amount you use. This added bulk comes from an air bubble inside each phosphate granule. Consequently, no cost or weight is added.

**DISSOLVE FASTER** Spray-dried phosphates dissolve two or three times faster than ordinary forms because they have so much more surface area. They flow freely. Their high air content keeps them loose all the time.

**99% PURE** When you get your spray-dried phosphates from Hooker you can be sure you're getting the highest purity available. They range from 97% to 99% pure.

Choose the one that meets your needs—sodium tripolyphosphate or tetrasodium pyrophosphate. Hooker can supply you with either.

For more information on how to make better detergents by using these phosphates, write to the address below.

You can also get the following in regular density: disodium phosphate, trisodium phosphate, sodium hexametaphosphate, and sodium tripolyphosphate.

**HOOKER CHEMICAL CORPORATION**  
PHOSPHORUS DIVISION, Dept. CW-1

60 E. 42nd Street, New York 17, N. Y.

Murray Hill 2-2500



## Question:

Paint manufacturers: Are the raw material costs in your primer coatings higher than you think they should be?

## Answer:

Then try Neville's LX 685 resin. This versatile material is designed to extend high-priced phenolics or other expensive raw materials without losing desirable primer properties. LX 685 benefits include increased hardness, lower molecular weight, better adhesion, higher acid resistance and quicker drying time. Our Technical Service Department will help you fit this star performer into your formulae for primers or other types of coatings. Write to us. There will be no obligation.

**NEVILLE CHEMICAL COMPANY**  
PITTSBURGH 25, PA.

**NEVILLE**

## ADMINISTRATION

Jersey Standard's request, he said, one clause of the firm's contract with WNTA-TV (New York City area television station) "specifies that we will have no voice in the subject matter, script, production techniques or cast of each week's play."

It is common practice in TV for sponsors and agencies to insist on approval of vehicles, usually with a view to avoiding controversy.

Jersey Standard, a holding company, does no product advertising, hence devotes its commercial time to institutional messages. Volume of advertising on the program is expected to be only a small part of the maximum 12 minutes allowed a two-hour nighttime program and will be presented during appropriate "intermissions."

The contract between Jersey Standard and the station covers one of the largest time sales ever registered by an independent TV outlet—14 hours a week. While terms of the sponsorship were not made public, the average cost of a week's presentation has been estimated at \$40,000.

## LABOR

**Rubber Vote:** About 300 production employees at American Synthetic Rubber Corp.'s Louisville, Ky., plant are expected this week to approve an agreement between ASRC and United Rubber Workers Local 423. Tentative settlement calls for a 6¢/hour wage increase each year during a three-year contract, and improved pension and insurance plans.

**Esso Vote:** The National Labor Relations Board has set Feb. 25 as voting day in a runoff election at Esso's Bayway, N.J., refinery between the Independent Petroleum Workers Union and three national unions. Workers will have five choices on the ballot: Oil, Chemical & Atomic Workers, Teamsters, Operating Engineers, IPWU or no union. In May '57, OCAW lost an election to the independents by a few hundred votes.

**Airco Strike:** At the calcium carbide plant of Air Reduction Co.'s National Carbide Co. division, near Calvert City, Ky., 330 employees have walked off the job after turning down a management offer of a two-year contract. The offer called for a

10¢/hour wage increase now, along with a 3½¢/hour fringe benefit increase, and an 8¢/hour increase in '61. Both maintenance and production employees, members of Local 7-556, Oil, Chemical & Atomic Workers, are involved.

## KEY CHANGES

**B. R. F. Kjellgren** to chairman, board of directors, and **George S. Mikhailapov** to president and **C. Baldwin Sawyer** to chairman, executive committee of the board, Brush Beryllium Co. (Cleveland).

**Colgate W. Darden, Jr.**, to board of directors, Du Pont (Wilmington, Del.).

**B. Hudson Milner** to board of directors, Federal Chemical Co. (Louisville).

**James T. Hill, Jr.**, to board of directors, Interchemical Corp. (New York).

**J. F. Warnell** to vice-president, sales, and **A. J. Adams** to vice-president, production, Union Carbide Consumer Products Co., division of Union Carbide Corp. (New York).

**Joseph J. Tumpeer** to senior vice-president, Witco Chemical Co., Inc. (New York).

**Raymond A. Reinke** to vice-president, International Division, Continental Carbon Co., subsidiary of Continental Oil Co. (Houston).

**Normand Phaneuf** to executive vice-president, **William E. Barger** to vice-president, manufacturing, and **Joseph Alderink** to corporate treasurer, The Ott Chemical Co. (Muskegon, Mich.).

**Edward J. Nawoj** to vice-president, manufacturing, and **James B. Ammon** to director, marketing, Baxter Laboratories, Inc. (Morton Grove, Ill.).

**James D. McNitt** to executive vice-president, Bristol Laboratories (Syracuse, N.Y.).

**N. E. Sylvander** to vice-president, operations, and **Benjamin W. Jones** to vice-president, sales, Pitt-Consol Chemical Co., subsidiary of Consolidation Coal Co. (Pittsburgh).

**Claude L. Alexander** to vice-president, American Can Co. (New York).

# FYI: CW Index and Reprints

- How to reap rewards through long-range planning.
- Present and prospective propylene markets.
- Cost accounting—every management man's business.
- Cellulose outlook is bright.
- How to exploit petrochemical treasures.
- What are the challenges for CPI in foreign trade?
- How do you rate your research?
- New producers are changing the world sulfur balance.
- Study of ethylene chemicals' outlook.
- How CPI firms can grow through vertical integration.
- Aromatics in trouble: facts of BTX industry.
- Steroids sales are growing.
- Contract research: Cure for coming crisis?
- Analysis of five key areas of atomic energy program.

Just check the desired items on the coupon below and mail to:

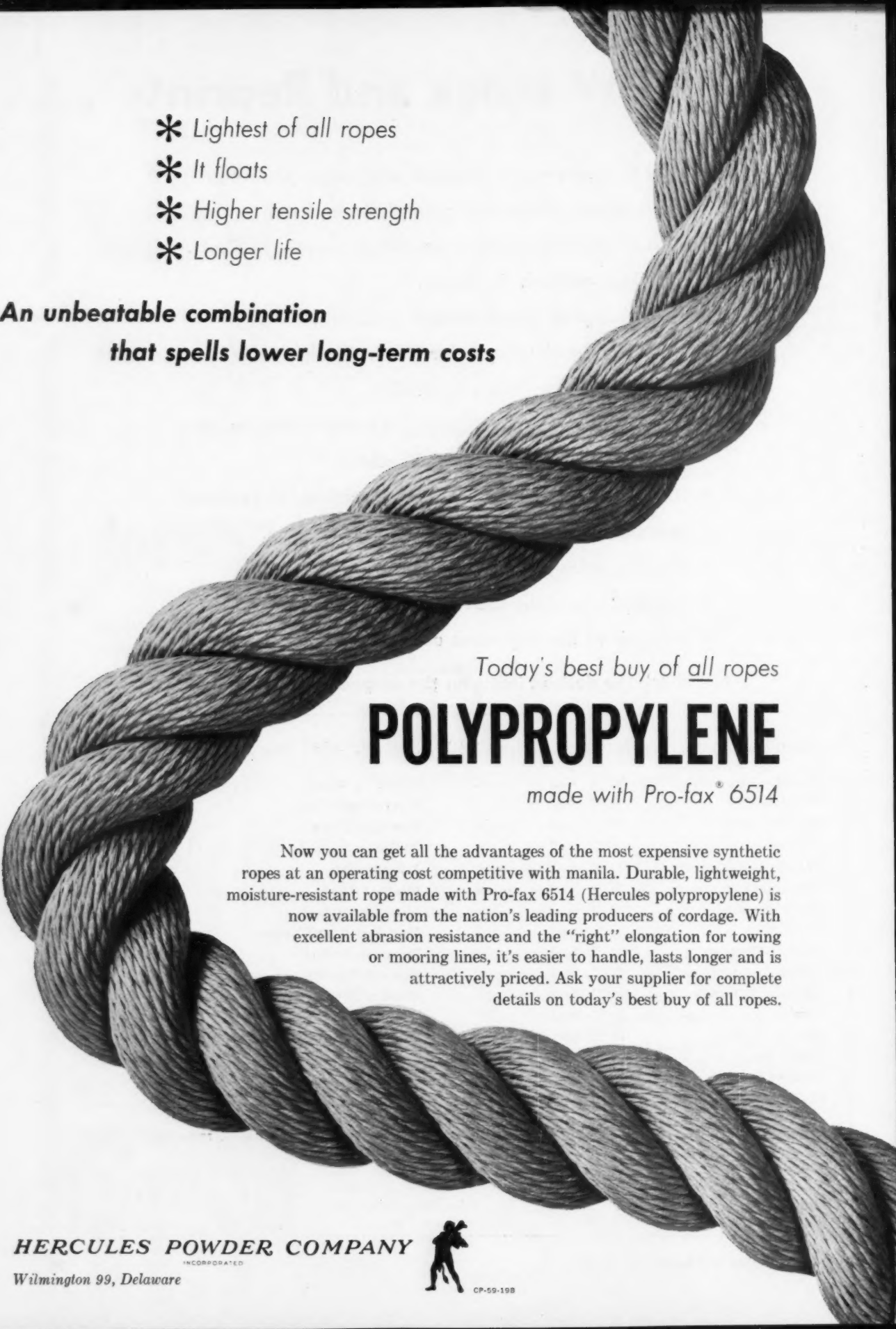
Chemical Week, Reprint Dept., Room 2400, 330 W. 42nd St., New York 36, N. Y.

Long-Range Planning .....	\$1 <input type="checkbox"/> Send — copies	Market for Waxes .....	\$1 <input type="checkbox"/> Send — copies
Propylene .....	\$1 <input type="checkbox"/> Send — copies	Cost-Cutting Methods .....	\$1 <input type="checkbox"/> Send — copies
Cost Accounting .....	\$1 <input type="checkbox"/> Send — copies	Man-Made Fibers .....	\$1 <input type="checkbox"/> Send — copies
Cellulose .....	\$1 <input type="checkbox"/> Send — copies	Motivation Research .....	\$1 <input type="checkbox"/> Send — copies
Petrochemical Treasures .....	\$1 <input type="checkbox"/> Send — copies	Petrochemicals .....	\$1 <input type="checkbox"/> Send — copies
New Trade Challenge .....	\$1 <input type="checkbox"/> Send — copies	Plastics Outlook .....	\$1 <input type="checkbox"/> Send — copies
Rating Research .....	\$1 <input type="checkbox"/> Send — copies	Ideas from Outsiders .....	\$1 <input type="checkbox"/> Send — copies
World Sulfur .....	\$1 <input type="checkbox"/> Send — copies	Your Next Capital Venture ..	\$1 <input type="checkbox"/> Send — copies
Ethylene Chemicals .....	\$1.50 <input type="checkbox"/> Send — copies	Paperwork Control .....	\$1 <input type="checkbox"/> Send — copies
Vertical Integration .....	\$1 <input type="checkbox"/> Send — copies	Dyes and Pigments .....	\$1 <input type="checkbox"/> Send — copies
Aromatics in Trouble .....	\$1 <input type="checkbox"/> Send — copies	Salesmen's Motivation .....	\$1 <input type="checkbox"/> Send — copies
Steroids .....	\$1 <input type="checkbox"/> Send — copies	Top Chemical Management Pay	\$1 <input type="checkbox"/> Send — copies
Contract Research .....	\$1 <input type="checkbox"/> Send — copies	Turn the Atom to Profit ....	\$1 <input type="checkbox"/> Send — copies
Atomic Energy .....	\$1 <input type="checkbox"/> Send — copies	Pesticides .....	\$1.50 <input type="checkbox"/> Send — copies
Packaged Plants .....	\$1 <input type="checkbox"/> Send — copies	Company Reorganization ....	\$1 <input type="checkbox"/> Send — copies
Pharmaceuticals .....	\$1 <input type="checkbox"/> Send — copies	CW Index Vol. 84, Jan.-June '59	.. 50¢ <input type="checkbox"/> — copies

Enclosed is \$ ..... for this order. (Special bulk rates on request.)

Name .....

Address .....

- 
- \* Lightest of all ropes
  - \* It floats
  - \* Higher tensile strength
  - \* Longer life

**An unbeatable combination  
that spells lower long-term costs**

Today's best buy of all ropes

# POLYPROPYLENE

made with Pro-fax® 6514

Now you can get all the advantages of the most expensive synthetic ropes at an operating cost competitive with manila. Durable, lightweight, moisture-resistant rope made with Pro-fax 6514 (Hercules polypropylene) is now available from the nation's leading producers of cordage. With excellent abrasion resistance and the "right" elongation for towing or mooring lines, it's easier to handle, lasts longer and is attractively priced. Ask your supplier for complete details on today's best buy of all ropes.

**HERCULES POWDER COMPANY**

INCORPORATED

Wilmington 99, Delaware



CP-59-10B



# Market Newsletter

CHEMICAL WEEK  
January 30, 1960

Here's more on the fast-moving West Coast vinyls situation, cued by last week's brief item that Goodrich Chemical was "building" a new plant at Watson, Calif.

- Scientific Design has been given the contract to design and construct the polyvinyl chloride (PVC) facility. (Though no figure has been company-confirmed, capacity will likely be 20 million lbs./year.)

- The Watson unit is the same one that American Chemical had commissioned SD to build, and in fact, on which construction had already been under way when American Chemical changed its mind and decided to "sell" the proposed operation to Goodrich. Goodrich did not "assume" the American Chemical-SD contract—the latter was terminated and a new one was negotiated.

- Word is that American Chemical will supply vinyl chloride monomer to the upcoming PVC plant in a pipeline, over-the-fence deal. The monomer plant, incidentally, is in the midst of startup this week, will be rolling full-tilt when Goodrich's PVC plant is ready in the second quarter of this year.

Behind American Chemical's decision to pull out of the polymer field: the Richfield-Stauffer venture is short on technical and marketing background in PVC, and this, admittedly, is expensive and time-consuming to acquire. Result: the firm will confine itself to a more logical role of supplying chemicals—ethyl chloride, ethylene dichloride and the monomer.

Stauffer will continue its own activities in the plastics arena, and will be "developing a broader position in such products," a company spokesman tells CHEMICAL WEEK. It will, for one thing, purchase some American Chemical chloride monomer to convert into specialty resins and copolymers for its own use.

The new Goodrich plant is one of several PVC installations that Scientific Design has built in the small- to medium-capacity package plants. Among its clients: The Pantasote Co., Cary Chemicals, General Tire and Rubber, Borden Chemical, Thompson Chemical.

•

Prices of tantalum metal and chemicals are reduced up to 25% by Fansteel Metallurgical, bringing cost of metal powder down to \$30/lb. The cuts—which also bring down tabs on tantalum carbide and tantalum oxide—are spurred by several factors, including increased output at Fansteel's new plant at Muskogee, Okla., which is now reportedly running at peak capacity.

## Market Newsletter

(Continued)

Fansteel's price cuts follow earlier reductions posted by Kawecki, which established these prices: tantalum metal, \$30/lb.; tantalum oxide, \$13.50/lb.; tantalum carbide, \$20/lb.

Meanwhile Union Carbide Metals says it plans no price cuts now, reiterates that it reduced tabs on "high-purity melting stock" from \$60 to \$35/lb. last year (*CW Market Newsletter*, June 13, '59).

**Price of neopentyl glycol is reduced 5¢/lb. to 32¢/lb.** (carload drums) and 33¢/lb. l.c.l. by Eastman Chemical Products. The chemical—which is derived from isobutyraldehyde obtained via Eastman's oxo process—goes into polyesters, polyurethanes, plasticizers, alkyd resins.

**Over 50 million lbs. of aluminum will be used to make cans** in '60, according to a just-completed survey by Kaiser Aluminum and Chemical. This optimistic expectation of a threefold consumption increase in one year—from about 15 million lbs. used in '59—is partly attributed to commodity prices established two years ago on the aluminum can stock.

Admittedly, price of aluminum can stock is not directly competitive with tinplate, but reduced finishing costs, it's claimed, pull over-all aluminum can costs to more competitive levels.

**Prices of fluorosilicone rubbers are being cut about 25%** by Dow Corning Corp. Reductions on the firm's Silastic LS series of oil fuel and solvent-resistant silicone rubbers—effective Feb. 1—bring costs down to less than 50% of the original price of \$30/lb.

**The Tennessee Valley Authority is substituting coal for coke** to fill part of its total fixed carbon needs for manufacture of phosphorus. An order for 24,000 tons of coal (with option to increase it 10%) has been given to Island Creek Coal Sales (Huntington, W. Va.); possible maximum cost: \$323,400.

The coal order will furnish about 50% of TVA's carbon requirements in the next six months and will result in estimated savings of \$128,000.

**The one-millionth ton of liquid oxygen-nitrogen** has been turned out by USAF's Air Research and Development Command. At five different locations in the U.S., ARDC makes 85% of the total liquid oxygen-nitrogen consumed by the Air Force.

The over-all operation consists of 15 plants built and operated by Air Products, Inc. Santa Susana, Calif., is the largest with five units; four more are located at Nimbus, Calif., and two each at Denver, Colo., Cape Canaveral, Fla., and Edwards Air Force Base at Edwards, Calif.

# ANNOUNCING

A NEW SOURCE FOR

# ANHYDROUS ETHYL ALCOHOL

NOW AVAILABLE IN  
SPECIALLY DENATURED FORMULAS  
AND  
JAYSOL<sup>®</sup> PROPRIETARY SOLVENTS

TENTATIVE SPECIFICATIONS FOR THE UNDENATURED PRODUCT

Purity, Vol. o/o	99.9 Min.
Color, Pt-Co	15 Max.
Sp. Gr. 60/60° F.	0.794 Max.
Acidity, as Acetic, Wt. o/o	0.002 Max.
NVM, Wt. o/o	0.003 Max.
Appearance	Clear and Free of Suspended Matter

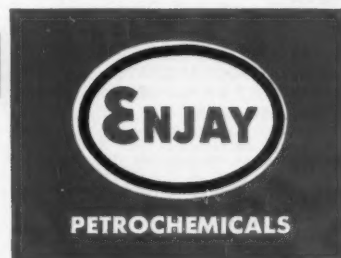
For more information on Enjay Anhydrous Ethyl Alcohol, contact the Enjay Office nearest you.

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY  
ENJAY COMPANY, INC.

15 West 51st Street, New York 19, N.Y.

Akron • Boston • Charlotte • Chicago • Detroit • Los Angeles • New Orleans • Tulsa

January 30, 1960 • Chemical Week



# 437

## NEW CHEMICALS FOR INDUSTRY

Each of the 437 chemical products in this report was introduced in the past year, qualifies as: (1) a new chemical product, (2) a new grade, or (3) a product with a new degree of availability. For addresses see *Chemical Week Buyers' Guide Issue*, Sept. 26, '59.

### AA QUALITY SEMICONDUCTOR GRADE ELEMENTAL PHOSPHORUS (white phosphorus)

P<sub>4</sub>; M.W., 30.975; Sp.G., 1.829 g./ml. at 20 C; M.P., 44.1 C; B.P., 280 C; Purity: impurities below limits of detection; Solubility: insoluble in water. Chemical properties: newly developed, ultra high purity material. Suggested uses: preparation of Groups III and V compounds and metal phosphides. Introduced as: significantly new grade. Availability: commercial quantities. The American Agricultural Chemical Co.

### p-ACETYLAMINOBENZENESULFONYL CHLORIDE

C<sub>8</sub>H<sub>8</sub>NO<sub>2</sub>ClS. M.W., 233.5; M.P., 126-128 C. Chemical properties: white crystal; 40-50% moisture by weight. Suggested uses: intermediate for pharmaceuticals and cosmetics; chemical intermediate. Introduced as: product with new degree of availability. Availability: commercial quantities. Diamond Alkali Co., Chlorinated Products Div.

### ACL-59® POTASSIUM DICHLOROISOCYANURATE (1-potassium-3,5-dichloro-2,4,6-trioxhexa- hydro-1,3,5-triazine)

Cl<sub>2</sub>C<sub>3</sub>KN<sub>3</sub>O<sub>3</sub>; M.W., 236; Sp.G., ca. 1.0; M.P., 240-250 C with decomposition; Available Chlorine Content, 39.6% (typical). Solubility: 9 gm. per 100 gm. water at 25 C. Chemical properties: dry, stable organic chlorine carrier with high solubility in water; excellent bleaching and oxidizing characteristics. Suggested uses: source of available chlorine for household and commercial laundry dry bleaches, machine dishwashing compounds, sanitizing agents and scouring

cleansers. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Div.

### ACRYLOID AT-50 (thermosetting acrylic ester solution)

Chemical properties: thermosets to give very hard, glossy, baking enamel film. Suggested uses: vehicle for coatings on appliances, metal furniture, hospital equipment. Introduced as: significantly new grade. Availability: commercial quantities. Rohm & Haas Co., Resinous Products Div.

### ACRYSOL A-41

Solubility: infinitely soluble in water. Chemical properties: 30% active aqueous solution of an acrylic resin; excellent adhesion for nylon. Suggested uses: warp size for filament nylon. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Textile Div.

### ADIPIC ANILIDE (adipic dianilide)

C<sub>15</sub>H<sub>20</sub>N<sub>2</sub>O<sub>2</sub>. M.W., 296; M.P., 235 C; Solubility: insoluble in water, alcohol, acetone, benzene; soluble in dimethylformamide, especially hot. Suggested uses: rubber additive. Introduced as: new chemical product. Availability: semicommercial quantities. City Chemical Corp.

### ADOGEN 57 (erucyl amide)

RCONH<sub>2</sub> R = fatty chain, principally unsaturated C<sub>22</sub>; M.W., 328-342 av.; Sp.G., .888; M.P., 75-80 C; FFA%, max. 5; Iodine Value, 80-85; Moisture, max. 0.5; Gardner Color, '53-10; Physical Form, solid; predominant chain length, 80% C<sub>22</sub> (erucyl). Purity: amide content, 90%; Solubility: soluble in isopropanol; slightly soluble in ethanol, acetone, ethyl acetate, cyclo-

hexane, and acetonitriles. Suggested uses: foam stabilizers in detergents and water repellants; antiblock agents in plastic films; in wet-waxed paper coatings; adhesion of printing inks; emulsions for textiles, masonry, metals and paper; mutual solvents for waxes and resin; and also used in plastics, pressure sensitive tapes, molded rubber products, and wire drawing lubricants. Introduced as: new chemical product. Availability: commercial quantities. Archer-Daniels-Midland Co., Development Dept.

### ADOGEN 101D (distilled arachidyl behenyl amine)

R-NH<sub>2</sub> R = saturated fatty chain, principally C<sub>20</sub> and C<sub>22</sub>; Approx. Combining Wt., 295; Iodine Value, 5 max.; Physical Appearance, white solid; Purity: primary amine content, 97%; Solubility: soluble in benzene, butanol, butyl acetate, cyclohexane, ethanol, isopropanol, methanol, tetrachloromethane, trichloromethane; slightly soluble in acetone, ethyl acetate, ethyl ether. Suggested uses: surface active agents, ore flotation, corrosion inhibitors, rubber compounding, textile auxiliaries and intermediates in bactericides, detergents, softening and dispersing agents, lubricating oil additives, etc. Introduced as: new chemical product. Availability: commercial quantities. Archer-Daniels-Midland Co., Development Dept.

### ADOGEN 201 (di-arachidyl-behenyl amine)

R<sub>2</sub>NH R = saturated fatty chain, principally C<sub>20</sub> and C<sub>22</sub>; Iodine Value, 5 max.; Purity: secondary amine content, 90%; Solubility: insoluble in acetone, butanol, butyl acetate, cyclohexane, ethanol, ethyl acetate, ethyl ether, isopropanol and methanol; very slightly soluble in benzene, tetrachloromethane and trichloromethane. Suggested uses: surface active agents, corrosion inhibitors, rubber compounding, textile



auxiliaries; intermediates in bactericides, detergents, softening and dispersing agents; lubricating oil additives. Introduced as: new chemical product. Availability: laboratory quantities. Archer-Daniels-Midland Co., Development Dept.

#### ADOGEN 363 (tri-lauryl amine)

R<sub>3</sub>N R = saturated fatty chain, principally C<sub>12</sub>; Approx. Combining Wt., 521; Predominant Chain Length, 90% C<sub>12</sub>; Physical Appearance, pale yellow liquid. Purity: tertiary amine content, 92% min.; Solubility: infinitely soluble in benzene, carbon tetrachloride, ethyl ether, butyl acetate, 2-butanone, n-butanol, cyclohexane, chloroform, ethyl acetate. Suggested uses: uranium ore extraction, corrosion inhibitors, extractors of acids from water solutions, urethane foam catalysts and intermediates for complex fatty quaternary ammonium compounds. Introduced as: new chemical product. Availability: commercial quantities. Archer-Daniels-Midland Co., Development Dept.

#### ADOGEN 401

##### (tri methyl, arachidyl-behenyl quaternary)

Iodine Value, 3 max.; Purity: approx. 50% quaternary ammonium compound. Suggested uses: fluffing or softening agents, detergents, antistatics, sanitizers and dyeing aids for the textile and laundry industries; bactericides in antiseptic solutions, hair rinses, after-shave lotions, deodorants, mouth washes, algicides, and for mold and bacteria control; corrosion inhibitors, emulsifiers, viscosity stabilizers, and wetting agents. Introduced as: new chemical product. Availability: laboratory quantities. Archer-Daniels-Midland Co., Development Dept.

#### ADOGEN 402

##### (di methyl, di-arachidyl-behenyl quaternary)

Iodine Value, 3 max.; Purity: approx. 75% quaternary ammonium compound. Suggested uses: fluffing or softening agents, detergents, antistatics, sanitizers and dyeing aids for the textile and laundry industries; bactericides in antiseptic solutions, hair rinses, after-shave lotions, deodorants, mouth washes, algicides, and for mold and bacteria control; corrosion inhibitors, emulsifiers, viscosity stabilizers, and wetting agents. Introduced as: new chemical product. Availability: laboratory quantities. Archer-Daniels-Midland Co., Development Dept.

#### AEROSPRAY 52 BINDER

Constituents: water emulsion of a synthetic resin. Sp.G., 1.06; pH, 8.9; Chemical properties: excellent freeze-thaw stability; water emulsion. Suggested uses: form protective crusts on exposed coal and mineral fines to prevent materials loss due to rain and winds from stockpiles or open railroad cars. Introduced as: significantly new grade. Availability: commercial quantities. American Cyanamid Co., Organic Chemicals Div.

#### ALAMINE 15D (oleyl-linoleyl amine) (octadecene-octadecadiene amine)

C<sub>18</sub>H<sub>33-34</sub>NH<sub>2</sub>; Sp.G., 0.83; M.P., 19 C; B.P., 198-209 C; Amine No., 200-210; Iodine Value, 90 min.; Purity: 97% min. primary amine; Solubility: excellent solubility in many organic solvents; extremely low solubility in water. Chemical properties: highly unsaturated primary amine. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALAMINE 204

##### (dilauryl amine) (didodecylamine)

(C<sub>12</sub>H<sub>25</sub>)<sub>2</sub>NH. Sp.G., 0.89; M.P., 45 C; Iodine Value, 3 max.; Amine Value, 153-167; Purity: 85% min. secondary amine; Solubility: very low water solubility. Chemical properties: cationic; undergoes typical secondary amine reactions. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALAMINE 205 (dimyristyl amine) (ditetradecylamine)

(C<sub>14</sub>H<sub>29</sub>)<sub>2</sub>NH. Sp.G., 0.89; M.P., 52 C; Iodine Value, 4 max.; Amine Value, 132-143; Purity: 87% min. secondary amine; Solubility: very low water solubility. Chemical properties: cationic; undergoes typical secondary amine reactions. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALAMINE 206 (dipalmityl amine) (dihexadecylamine)

(C<sub>16</sub>H<sub>33</sub>)<sub>2</sub>NH. Sp.G., 0.83; M.P., 65 C; Iodine Value, 5 max.; Amine Value, 116-126; Purity:

85% min. secondary amine; Solubility: very low water solubility. Chemical properties: cationic; undergoes typical secondary amine reactions. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALAMINE 207 (distearylamine) (dioctadecylamine)

(C<sub>18</sub>H<sub>37</sub>)<sub>2</sub>NH. Sp.G., 0.85; M.P., 69 C; Iodine Value, 5 max.; Amine Value, 100-110; Purity: 85% min. secondary amine; Solubility: very low water solubility. Chemical properties: cationic; undergoes typical secondary amine reactions. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALAMINE 215 (di (oleyl-linoleyl) amine) (di (octadecene-octadecadiene) amine)

(C<sub>18</sub>H<sub>33-34</sub>)<sub>2</sub>NH. Sp.G., 0.84; M.P., 35 C; Amine Value, 105-115; Iodine Value, 90 min.; Purity: 85% min. secondary amine; Solubility: moderately soluble in many organic solvents; very low solubility in water. Chemical properties: highly unsaturated secondary amine. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALAMINE 304 (trilauryl amine) (tridodecylamine)

(C<sub>12</sub>H<sub>25</sub>)<sub>3</sub>N. Sp.G., 0.82; M.P., 14 C; Amine Value, 98-116; Purity: 90% min. tertiary amine; Solubility: excellent solubility in many organic solvents; virtually insoluble in water. Chemical properties: will undergo quaternization reactions, ion exchange reactions. Suggested uses: chemical intermediates, metal complexes. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALAMINE 321 (tricoco amine)

Constituents: a tertiary amine, derived from coconut oil; typical chain length composition: 3% C<sub>8</sub>, 5% C<sub>10</sub>, 45% C<sub>12</sub>, 20% C<sub>14</sub>, 9% C<sub>16</sub>, 18% C<sub>18</sub>. Sp.G., 0.82; M.P., 31 C; Amine Value, 91-107; Purity: 90% min. tertiary amine; Solubility: good solubility in many organic solvents; virtually insoluble in water. Chemical properties: will undergo quaternization reactions, ion exchange reactions. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALBATEX HW

Solubility: readily soluble in water; solutions are anionic and stable to weak acids. Chemical properties: a light tan powder; enables dyeing under acid conditions; prevents staining of the wool by direct dyes; excellent penetration action for wool dyestuffs; allows the exact matching of shades even for two-color effects; insures good hand and natural wool quality. Suggested uses: dyeing wool and cellulosic blends. Introduced as: new chemical product. Availability: commercial quantities. Ciba Co., Inc., Chemical Specialties Div.

#### ALCOA HYDRATED ALUMINA XC-35 (aluminum oxide)

Al<sub>2</sub>O<sub>3</sub>; Constituents: this new hydrated alumina has the lowest soda content yet available to industry. Typical Soda Level, .040 per cent sodium monoxide. Chemical properties: lowest soda content available; particle size distribution satisfactory for pelletizing. Suggested uses: wide application as a catalyst base and where requirements call for an extremely low soda content. Introduced as: significantly new grade. Availability: commercial quantities. Aluminum Co. of America.

#### ALIPAL LO-529

Sp.G., 1.10; Solubility: good solubility in a wide variety of polar and nonpolar solvents. Chemical properties: sodium salt of a complex organic phosphate ester; colorless, viscous, pleasant-smelling liquid having detergent and corrosion-inhibiting properties; low-foaming. Suggested uses: in formulating hard-surface detergents and wax and resin floor finishes; in increasing the viscosity of solutions. Introduced as: new chemical product. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Div.

#### ALIQAT 15 (50% isopropanol solution) (octadecene-octadecadiene) trimethyl ammonium chloride)

[(C<sub>18</sub>H<sub>33-34</sub>)<sub>3</sub>N(CH<sub>3</sub>)<sub>3</sub>] Cl. Sp.G., 0.88; Pour Pt., -50 C; NaCl, 1% max.; pH, 9 max.;

Solubility: very soluble in many organic solvents and water. Chemical properties: cationic; surface active. Uses: chemical intermediates, petroleum production. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALIQAT 215 (75% solution in isopropanol) (dioctadecene-octadecadiene) dimethyl ammonium chloride)

[(C<sub>18</sub>H<sub>33-34</sub>)<sub>2</sub>N(CH<sub>3</sub>)<sub>2</sub>] Cl. Sp.G., 0.91; Pour Pt., -50 C; NaCl, 0.5% max.; pH, 9 max.; Solubility: very soluble in many organic solvents and water. Chemical properties: cationic; surface active. Suggested uses: chemical intermediates, petroleum production. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALIQAT 336 (75% solution in isopropanol) (trioctylmethyl ammonium chloride)

[(C<sub>8</sub>H<sub>17</sub>)<sub>3</sub>NCH<sub>3</sub>] Cl. Sp.G., 0.86; Pour Pt., -35 C; NaCl, 0.5% max.; pH, 5-7; Solubility: excellent solubility in many organic solvents; very low solubility in water. Chemical properties: cationic; surface active. Suggested uses: chemical intermediates, petroleum production. Introduced as: new chemical product. Availability: commercial quantities. General Mills, Inc., Chemical Div.

#### ALKALI BLUE: G PULP CP-1347, R PULP CP-1331, EXTRA RED PULP CP-1391

Constituents: contain approximately 25% solids; Purity: commercial. Chemical properties: these pulps have been neutralized to a pH of 7.5 and are therefore suitable for all types of water flexographic inks. Suggested uses: especially developed for use in water type flexographic inks. Introduced as: new chemical products. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

#### ALLYL CYANIDE (3-butenenitrile)

C<sub>4</sub>H<sub>5</sub>N; M.W., 67; Sp.G., 0.8341; M.P., -87 C; B.P., 119 C; Purity: 98%; Solubility: very slightly soluble in water. Chemical properties: polymerizes easily. Suggested uses: cross-linking agent in polymerization. Introduced as: product with new degree of availability. Availability: commercial quantities. Aceto Chemical Co., Inc.

#### ALUMINUM ASPIRIN

(aluminum monohydroxy diacetylsalicylate) C<sub>21</sub>H<sub>15</sub>AlO<sub>9</sub>; M.W., 402.3; Solubility: slightly soluble in alcohol, toluene, ethyl acetate; decomposed by water. Chemical properties: white powder; conforms to National Formulary specifications. Suggested uses: pharmaceutical (antipyretic analgesic). Introduced as: significantly new grade, new degree of availability. Availability: commercial quantities. Anderson Chemical Co., Div. Stauffer Chemical Co.

#### ALUMINUM PHOSPHIDE

AlP. Suggested uses: grain refining. Introduced as: new chemical product. Availability: laboratory quantities. Allied Chemical Corp., General Chemical Div.

#### AMBER BYF SERIES 100

Constituents: water-soluble fraction autolyzed Brewers Yeast. Total nitrogen, min. 9%; amino nitrogen as % of total nitrogen (Sorenson), min. 35%. Purity: commercial; Chemical properties: excellent stimulator of microbial growth. Suggested uses: economically useable in large quantities for production purposes; fermentation media component, vinegar bacteria food, chemical intermediate, amino acid source. Introduced as: significantly new grade, product with new degree of availability. Availability: commercial quantities. Amber Labs., Inc.

#### AMBER BYF SERIES 300

Constituents: fraction of autolyzed Brewers yeast. Total nitrogen, min. 8%; amino nitrogen as % of total nitrogen (Sorenson), min. 30%. Purity: commercial; Suggested uses: low cost source for industrial purposes of B vitamins, amino acids, peptones and peptides; fermentation media component; specialized animal feed ingredient; chemical intermediate raw material; amino acid and nitrogen source. Introduced as: significantly new grade, product with new degree of availability. Availability: commercial quantities. Amber Labs., Inc.

#### 2-AMINO ETHYL SULFURIC ACID

C<sub>2</sub>H<sub>7</sub>NO<sub>4</sub>S; M.W., 141; Sp.G., 1.782; M.P., 274-280 C; Purity: 98%; Solubility: soluble in water; insoluble in most organic solvents. Suggested uses: organic synthesis of ethyleneimine and other amino ethyl compounds. Introduced as: product with new degree of availability.

# 437

## NEW CHEMICALS

### FOR INDUSTRY

Availability: commercial quantities. Aceto Chemical Co., Inc.

#### 3-AMINO-4-MERCAPTOBENZOTRIFLUORIDE, ZINC SALT

$C_{14}H_{10}N_2S_2F_6Zn$ ; M.P., does not melt at 300 C; Purity: 85-90%; Solubility: soluble in pyridine, methanolic hydrogen chloride. Suggested uses: chemical intermediate; accelerator. Introduced as: new chemical product. Availability: laboratory quantities. Maumee Chemical Co.

#### 3-AMINOPROPANOL

$C_3H_8ON$ ; M.W., 75; Sp.G., 0.99; B.P., 184-186 C; Purity: 99% min.; Solubility: miscible with water, acetone, chloroform and ethanol. Suggested uses: intermediate for Panthenol, dialkylamino-propanols, surfactants, printing inks, resins, rubber and leather substitutes. Introduced as: product with new degree of availability. Availability: commercial quantities. Chemo Puro Mfg. Corp.

#### AMMONIUM CHROMIUM FLUORIDE

Suggested uses: chromizing. Introduced as: new chemical product. Availability: semicommercial quantities. Allied Chemical Corp., General Chemical Div.

#### AMMONIUM FERRIC FLUORIDE

Introduced as: new chemical product. Availability: laboratory quantities. Allied Chemical Corp., General Chemical Div.

#### $\alpha$ -ANISALDEHYDE

M.W., 136.14; Sp.G., liquid, 1.1274; solid, 1.258; M.P., 38-39 C and 3 C; R.I.,  $n_D^{20}$ , 1.5608; Flash Pt., 244 F; Purity: 95% min.; Solubility: slightly soluble in water. Chemical properties: toxicity unknown, recommend caution. Suggested uses: pharmaceutical and chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansil Chemical, Market R & D.

#### "ANSAR" CACODYLIC ACID

$(CH_3)_2AsO.OH$ ; M.W., 137.99; M.P., 200 C; Solubility: at 20 C, 200g./100g. water; 36g./100g. alcohol; insoluble in ethyl ether. Chemical properties: toxicity data not complete, recommend caution. Suggested uses: pasture and lawn renovation; defoliant; desiccant; selective, pre-emergent herbicide; seed fungicide; aquatic weed control. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansil Chemical, Market R & D.

#### ARMOFLO® 49, 61, 62, 65, 610

M.P., 49 = 10 C; 61 = 16 C; 62 = 20 C; 65 = 5 C; 610 = 8 C. Chemical properties: fluid at or about room temperatures; ability to coat cationic receptive surfaces in a very thin, hydrophobic layer. Suggested uses: anticaking of hygroscopic single salts, blends of salts, and granulated fertilizers; control of dusting. Introduced as: new chemical product. Availability: commercial quantities. Armour Industrial Chemical Co.

#### ARMOHIB® 25

Sp.G., 0.89 at 25 C; Pour Pt., < 0 F; % solids, 50%. Solubility: water dispersible, acid soluble. Chemical properties: effectively inhibits acid corrosion at concentrations as low as 0.03% basis total liquor. Suggested uses: inhibitor against corrosive attack of metals by sulfuric, sulfamic or phosphoric acid solutions. Introduced as: new chemical product. Availability: commercial quantities. Armour Industrial Chemical Co.

#### ARMOHIB® 28

Sp.G., 0.939; Pour Pt., 60 F; % activity, 100%. Solubility: water dispersible, acid soluble. Chemical properties: inhibitor for hydrochloric or citric acid solutions on stainless steel types 316 and 420, monel, bronze and mild steel. Suggested uses: acid inhibitor for dilute hydrochloric or citric acids. Introduced as: new chemical product. Availability: commercial quantities. Armour Industrial Chemical Co.

#### AROGEL #909-P (processed starch)

Constituents: modified potato starch; Purity:

meets NCA specifications; Solubility: dispersible in 175 F aqueous solutions. Chemical properties: thickener and stabilizer with exceptional stability properties even under high temperatures, high acid cook-up. Suggested uses: canned and jarred food products, salad dressings, sauces and gravies. Introduced as: significantly new grade. Availability: commercial quantities. Morningstar-Faisley, Inc., Food Products Div.

#### ATAC (acetyl triallyl citrate)

$C_{17}H_{22}O_8$ ; M.W., 354.3; Sp.G., 20/20 C (A.S.T.M. D268-46/3): 1.140  $\pm$  0.003; B.P., 142-143 C at 0.2 mm. Hg; Flash Pt. (Cleveland open cup): 341 F; R.I. 25 C: 1.464-1.465. Purity: min. assay, 95%; Solubility: miscible with all classes of commonly used solvents, except water. Chemical properties: an allyl ester containing three polymerizable allyl groups. Suggested uses: will homo-polymerize into thermo setting polymers; will cross link with unsaturated polyesters forming copolymers. Introduced as: new chemical product. Availability: semicommercial quantities. Miles Chemical Co., Div. Miles Laboratories, Inc.

#### AUTOSET (urea-formaldehyde resin)

Purity: 65% resin solids in water. Chemical properties: heat setting resin offering a number of advantages in particle-board manufacture—no catalyst needed, no plant mixing, less resin required, no pre-cure with material waste, no ammonia fumes, no viscosity build-up, no reactive change; higher internal bonds, less influence from humidity, shorter press cycles, uniform and consistent production. Suggested uses: manufacture of particle board. Introduced as: new chemical product. Availability: commercial quantities. Borden Chemical Co.

#### AVADEX®, WILD OAT KILLER (2,3-dichloroallyldiisopropylthiol-carbamate)

Constituents: an emulsifiable formulation containing 4 lbs. of active per gallon. Chemical properties: new herbicide that for the first time provides selective control of wild oats—even in grains such as barley as well as in flax, sugar beets and other crops. Suggested uses: as a wild oat specific herbicide. Introduced as: new chemical product. Availability: commercial quantities—in Canada in spring of 1960. Monsanto Chemical Co., Organic Div.

#### BARIUM BROMATE

$Ba(BrO_3)_2 \cdot H_2O$ ; M.W., 411.2. Solubility: very slightly soluble in cold water; slightly soluble in hot water. Suggested uses: preparation of other bromates. Introduced as: product with new degree of availability. Availability: semicommercial quantities. City Chemical Corp.

#### BASIC ZIRCONYL CHLORIDE SOLUTION (zirconyl hydroxychloride)

$ZrO_2HCl \cdot nH_2O$ ; M.W., 159.69 (anhydrous); Sp.G., 1.26 (solution); Solution assays 20% by weight zirconium oxide. Purity: pharmaceutical grade; Solubility: does not crystallize on evaporation of aqueous solution; forms a soluble glass. Chemical properties: much less acidic than zirconyl chloride ( $ZrOCl_2 \cdot 8H_2O$ ). Suggested uses: in body deodorants; precipitation of color lakes and toners; water-repellents for textiles. Introduced as: new chemical product. Availability: commercial quantities. National Lead Co., Titanium Alloy Mfg. Div.

#### N,N'-BIS(CARBOXYMETHYL)-DITHIO-OXAMIDE

$(HOOCCH_2NHCS)_2$ ; M.W., 236.3; M.P., 208.6-210 (dec). Solubility: 0.77 gm./100 ml. water; 2.8 gm./100 ml. acetone; 6.4 gm./100 ml. methanol. Chemical properties: light brown powder; forms highly stable, colored complexes with many metal ions, condensation reactions with amines, cyclization with  $\alpha$ -halo carbonyl compounds. Suggested uses: pigments, metal deactivators, chemical intermediates, plant growth regulators, analytical reagent and rodent repellents. Introduced as: new chemical product. Availability: developmental quantities. Mallinckrodt Chemical Works.

#### BIS(CHLOROMETHYL)ALKYLBENZENES

$C_9H_{10}(CH_2Cl)_2$  and  $C_{10}H_{12}(CH_2Cl)_2$ ; Constituents: bis(chloromethyl)alkylbenzenes from  $C_9$  and  $C_{10}$  hydrocarbons. M.W., 225 (average); Sp.G., 1.1 at 80 C; M.P., 35 to 80 C; B.P., 170 to about 200 C at 20 mm. Hg; aliphatic chlorine, 30 to 32%. Purity: completely aromatic; Solubility: soluble (hot) in all common organic solvents; some solubility at room temperature in carbon tetrachloride, methanol, and petroleum ether; insoluble in water. Chemical properties: white to yellow-tinted solid or semi-solid; reactive chloromethyl groups (mainly meta) form derivatives readily; skin irritant. Suggested uses: chemical intermediate to make bis-esters, bis-

ethers, glycols, etc., for use as functional fluids or in rubber compounding; polymers (polyesters, polyethers, polyurethanes, polysulfides, polycarbonates, silicones, etc.) will be useful as adhesives, elastomers, plasticizers, functional fluids, fibers and surface coatings. Introduced as: new chemical product. Availability: semicommercial quantities (limited). International Minerals and Chemical Corp., Research Div.

#### BIS(N,N'-DIMETHYL) PHOSPHORODIAMIDIC CHLORIDE

M.W., 170.6; B.P., 88 C at 2 mm. Solubility: R.I.,  $n_D^{20}$ , 1.4635. Chemical properties: acid chloride; water-white liquid. Suggested uses: insecticide intermediate. Introduced as: new chemical product. Availability: semicommercial quantities. Victor Chemical Works Div., Stauffer Chemical Co.

#### N,N'-BIS (2-HYDROXYETHYL)-DITHIOOXAMIDE

$(HOCH_2CH_2NHCS)_2$ ; M.W., 208.3; M.P., 92.9-93.8. Solubility: 1.0 gm./100 ml. water; 19.0 gm./100 ml. acetone; 18.4 gm./100 ml. methanol. Chemical properties: bright yellow powder; forms highly stable, colored complexes with many metal ions, condensation reactions with amines, cyclization with  $\alpha$ -halo carbonyl compounds. Suggested uses: pigments, metal deactivators, chemical intermediates, plant growth regulator, analytical reagent and rodent repellents. Introduced as: new chemical product. Availability: developmental quantities. Mallinckrodt Chemical Works.

#### BIS(PHENOXYPHENYL) ETHER. MIXED ISOMERS

$C_{24}H_{18}O_3$ ; M.W., 354.4; Sp.G., 1.18 at 68 F; Pour Pt., 20 F; B.P., above 800 F at 760 mm. Hg; 472 F at 2 mm. Hg; Viscosity of 70 cs. at 100 F, 6.4 cs. at 210 F, 1.4 cs. at 400 F. Purity: 100%; Solubility: miscible in acetone, benzene, carbon tetrachloride, styrene, perchloroethylene, Stoddard solvent; insoluble in water. Chemical properties: radiation, thermal and oxidation stability; good lubricant. Suggested uses: lubricants, greases, hydraulic and heat-transfer fluids exposed to high temperatures and/or nuclear radiation. Introduced as: new chemical product. Availability: laboratory quantities, semicommercial quantities. The Dow Chemical Co., Technical Service and Development Div.

#### BLANDOFEN AC

##### (polyvinyl methyl ether dispersion)

Sp.G., 0.957; M.P., below -10 C; Cloud point, 33.2 C. Solubility: readily dispersible in water. Chemical properties: yellow, opaque viscous liquid. Suggested uses: with Blandofen SL to improve the crock fastness of naphthol, sulfur, and pigment dyed or printed fabrics. Introduced as: product with new degree of availability. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Div.

#### BLANDOFEN SL

##### (nonionic polyethylene emulsion)

Sp.G., 0.98-1.00. Purity: 25% active; Solubility: dispersible in water. Chemical properties: thin, free-flowing milky emulsion. Suggested uses: in resin or starch finishes for textiles to improve sewability, hand and drape, tear strength, abrasion resistance, and crock fastness. Introduced as: product with new degree of availability. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Div.

#### BORON TRIFLUORIDE-PHENOLATE-POLYETHYLENE-GLYCOL MIX

1/3  $BF_3$  phenolate; Sp.G., 1.17 at 26/4°C. Introduced as: new chemical product. Availability: commercial quantities. Allied Chemical Corp., General Chemical Div.

#### BORON TRIFLUORIDE-PIPERIDINE COMPLEX

$BF_3 \cdot C_4H_8NH$ ; M.P., 75 C. Purity: reagent quality. Suggested uses: latent catalyst for epoxy resins. Introduced as: new chemical product. Availability: laboratory quantities. Allied Chemical Corp., General Chemical Div.

#### BRASSILIC ACID

##### (2, w undecanedicarboxylic acid)

$C_{13}H_{24}O_4$ ; M.W., 250; M.P., 110-112°C. Solubility: insoluble in water; freely soluble in alcohol, ether, chloroform; slightly soluble in benzene; insoluble in petroleum ether. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. City Chemical Corp.

#### BRITONE RED M CP-1394 (barium lithol)

Sp.G., 1.58. Purity: commercial; Solubility: good resistance to bleed in water. Chemical pro-

erties: general purpose, regular shade resinated barium lithol; combines high strength with a pleasing, clean shade. Suggested uses: recommended for general ink usage to replace weaker barium lithols of this shade. Introduced as: new chemical product. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

#### m-BROMOBENZOTRIFLUORIDE

$C_7H_4BrF_3$ ; M.W., 225; B.P., 153-158 C. Purity: 95% min.; Solubility: soluble in aromatic and other polar solvents. Suggested uses: pharmaceutical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Maumee Chemical Co.

#### o-BROMOBENZOTRIFLUORIDE

$C_7H_4BrF_3$ ; M.W., 225; B.P., 162-166 C. Purity: 95% min.; Solubility: soluble in aromatic and other polar solvents. Suggested uses: pharmaceutical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Maumee Chemical Co.

#### w BROMO-UNDECANOIC ACID (11-bromoundecanoic acid)

$C_{11}H_{21}O_2Br$ ; M.P., 49-50 C. Solubility: insoluble in water; soluble in alcohol, ether and hot petroleum ether. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. City Chemical Corp.

#### t-BUTYLAMINOETHANOL

$C_6H_{17}ON$ ; M.W., 117; M.P., 44-46 C; B.P., 90-92 C at 25 mm. Solubility: soluble in water, ethanol, benzene and n-heptane. Chemical properties: will undergo reactions characteristic of both the hydroxyl and amine groups. Suggested uses: may be useful as a chemical intermediate and an emulsifier for waxes and similar products. Introduced as: new chemical product. Availability: semicommercial quantities. Rohm & Haas Co., Special Products Dept.

#### t-BUTYLAMINOETHYL METHACRYLATE

$C_{11}H_{19}O_2N$ ; M.W., 185.26; Sp.G., 0.9145; B.P., 100-105 C at 12 mm. Solubility: soluble in all common organic solvents. Chemical properties: can undergo vinyl polymerization, reactions of the amine group, and additions to the double bond. Suggested uses: may be of interest as a polymerizable comonomer and a chemical intermediate; copolymers exhibit good color characteristics and may be useful in applications in which copolymers with basic properties are useful. Introduced as: new chemical product. Availability: semicommercial quantities. Rohm & Haas Co., Special Products Dept.

#### 1,2-BUTYLENE OXIDE (1,2-epoxybutane)

$C_4H_8O$ ; M.W., 72.1; Sp.G., (25/25 C), 0.826; B.P., (760 mm. Hg 5-9.5°), 62.0-64.5 C; Flash Pt. (closed cup), -15 F. Purity: >98%; Solubility: (25 C) completely miscible with common organic solvents; 8.24 gms. per 100 gms. of water. Chemical properties: typical alkylene oxide reactivity. Suggested uses: stabilizer for chlorinated solvents; intermediate. Introduced as: significantly new grade. Availability: commercial quantities. The Dow Chemical Co., Technical Service and Development Div.

#### N-BUTYLENE PYRROLIDINE

M.W., 125.21; Sp.G., 0.837; B.P., 154 C; Fr. Pt., -75 C; Flash Pt., 93 F. R.I., n<sub>D</sub> 20 D, 1.4375. Purity: 95%; Solubility: in water at 20 C, 4.5%; in water at 20 C, 10.0%. Chemical properties: undergoes reactions typical of tertiary amines; acute oral LD 50 is approx. 0.12 g./kg.; strongly alkaline; exposure should be avoided. Suggested uses: pharmaceutical and chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansul Chemical, Market R & D.

#### n-BUTYL LITHIUM (1-lithiobutane)

$C_4H_9Li$ ; Constituents: n-butyl lithium in n-hexane solution. M.W., 64.05; Sp.G., 7 gm./cm<sup>3</sup>. Solubility: soluble in benzene or saturated hydrocarbons. Chemical properties: inter metal conversion with alkyl or aryl halides; colorless to light straw; 1.5 molar; saturated hydrocarbons other than n-hexane, < 5.0%. Suggested uses: substitution in many cases for the conventional Grignard; catalyst for polymerization of unsaturated, e.g., styrene. Introduced as: significantly new grade, new degree of availability. Availability: semicommercial quantities. Anderson Chemical Co., Div., Stauffer Chemical Co.

#### n-BUTYLLITHIUM

$C_4H_9Li$ ; Constituents: solution in n-heptane (approximately 2.5 molar); available in other solvents if desired. M.W., 64.052; Density, ap-

prox. 0.70 gm./cm<sup>3</sup>; Stability, properly sealed, stable at least 2 months at room temperature. Purity: solution in n-heptane. Suggested uses: catalyst in polymerization of unsaturated gases to make synthetic rubber or resins; general synthetic work where attachment of n-butyl group is desired. Introduced as: new chemical product. Availability: commercial quantities. Lithium Corp. of America.

#### o-tert-BUTYLPHENOL

M.W., 150.2; Density at 20 C, 0.982 gms./ml.; Fr. Pt., -65 C; B.P., 224 C; Flash Pt., 110 C. Solubility: soluble in isopentane, toluene and ethyl alcohol; insoluble in water; reacts with 10% sodium hydroxide. Chemical properties: light yellow liquid. Suggested uses: chemical intermediate for synthetic resins, plasticizers, surface-active agents, perfumes, and other products. Introduced as: new chemical product. Availability: semicommercial quantities. Ethyl Corp.

#### CaFeMag, CRYSTALLINE (sodium glucoheptonate)

$C_7H_{13}O_6Na$ ; Chemical properties: sequestering agent for polyvalent metals, e.g., iron, calcium, magnesium, copper, aluminum; effective in caustic concentrations ranging from 2% to 30%. Suggested uses: metal cleaning, bottle washing, kief boiling, mercerizing, caustic boiloff. Introduced as: significantly new grade. Availability: commercial quantities. Pfister Chemical Works, Inc.

#### CARBOPOL 940 (vinyl carboxy polymer)

Sp.G., 1.42; Purity: >99.9%; Chemical properties: fluffy, white acid powder. Suggested uses: in cosmetic trade for water, water-alcohol or alcohol gels of sparkling clarity. Introduced as: significantly new grade. Availability: commercial quantities. B. F. Goodrich Chemical Co.

#### CASCO RESIN PR-490-53 (urea-formaldehyde resin)

Viscosity, 45-60 cps. at 25 F; pH, 6.9-7.1 at 25 F; Wt., 9.4 lbs./gal.; Storage Life, 4 mos. at 70 F. Chemical properties: amber, cationic urea formaldehyde (30% solids) developing wet strength right off the machine. Suggested uses: wet strength treatment of paper and paperboard. Introduced as: new chemical product. Availability: commercial quantities. Borden Chemical Co.

#### CATALIN RESIN 841 (urea-formaldehyde resin)

Sp.G., 1.295-1.305. Chemical properties: low viscosity makes it easily adaptable to spraying applications; has a low formaldehyde, which cuts down on odor during pressing. Suggested uses: for the production of particle board. Introduced as: significantly new grade. Availability: commercial quantities. Catalin Corp. of America, Resin Div.

#### CATALIST T-10

Solubility: infinitely soluble in water. Chemical properties: metal salt catalyst for thermosetting resins where minimum odor is desired. Suggested uses: catalyst with Rhonite D-12 and Rhonite N-17. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Textile Div.

#### 1,4-CHDM (1,4-cyclohexanedimethanol)

$C_8H_{16}O_2$ ; Constituents: 70% solution of the stereoisomeric mixture in methanol. M.W., 144.2; Sp.G., 0.9675 at 25 C; Flash Pt. (Tag Closed Cup), 67-68 F; R. I., n<sub>D</sub> 20, 1.4362. Purity: 70% in methanol; Chemical properties: two primary hydroxy groups producing good chemical reactivity; good thermal and hydrolytic stability that are imparted to derivatives. Suggested uses: reactant in the synthesis of saturated polyesters intended for use as plasticizers; in the preparation of unsaturated polyesters and polyurethanes. Introduced as: new chemical product. Availability: laboratory quantities. Eastman Chemical Products, Inc., Chemicals Div.

#### CHLORACETALDEHYDE ACETAL (2-chlorodiethyl acetal)

$C_4H_{10}ClO_2$ ; M.W., 152.5; Sp.G., 1.026 at 15 C; B.P., 157.4 C; R.I., 1.4152-1.416. Purity: 98%; Chemical properties: chlorine molecule reactive. Suggested uses: organic intermediate in production of amino acetals and in other syntheses. Introduced as: product with new degree of availability. Availability: commercial quantities. Aceto Chemical Co., Inc.

#### CHLOROACETIC ANHYDRIDE (chloroethanoic anhydride)

$ClCH_2CO_2O.CO_2CH_2Cl$ ; M.W., 170.99; M.P., 51-55°C; Purity: 97.5% by titration; Solubility: easily soluble in ether, chloroform; partly solu-

ble in benzene; insoluble in aliphatic hydrocarbons. Chemical properties: colorless to slightly yellow crystals with pungent odor; yields monochloroacetic acid on hydrolysis; alcoholysis yields chloroesters and the chloroacid. Suggested uses: possible use of chloroesters and amides for flameproofing textile; reactivity of chlorine atoms suggests possible use in pharmaceutical, perfume, flavor, plastics and plasticizer fields. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### CHLOROACETONITRILE (chloroethane nitrile)

$ClCH_2CN$ ; M.W., 75.50; Sp.G., 1.2020-1.2035 at 25/25 C; R.I., n<sub>D</sub> 20, 1.4210-1.4240. Purity: 97.5% min.; Solubility: insoluble in water; soluble in hydrocarbons, chlorinated solvents, alcohols, etc. Chemical properties: reactive chemical intermediate with two reactive centers; when heated in an autoclave with monochloroacetic acid to 110 C yields dichloro-diacetamide; heating Na or K salt of a fatty acid with chloroacetonitrile yields a glycolic acid nitrile. Suggested uses: fumigant for flour beetle and bed bug. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### 2-CHLORO-5-AMINO BENZOTRIFLUORIDE (4-chloro-3-trifluoromethylaniline)

$C_7H_5NClF_3$ ; Constituents: contains approx. 30% 2-chloro-3-aminobenzotrifluoride. M.P., semi-solidifies at about 20 C; Purity: approx. 70%; Solubility: soluble in aromatic and other polar solvents. Suggested uses: pharmaceutical, agricultural chemical, and dyestuff intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Maumee Chemical Co.

#### p-CHLOROBENZENESULFONAMIDE

$C_6H_6ClNO_2S$ ; M.W., 191.58; M.P., 145-148 C; Foreign Matter: not more than 15 ppm.; Sulfated Ash: not more than 0.1%; Moisture: not more than 0.1%. Purity: assay, not less than 98.5%; Solubility: an alcohol solution is colorless with no more than a slight turbidity. Chemical properties: a white, odorless powder. Suggested uses: pharmaceutical intermediate. Introduced as: new chemical product with new degree of availability. Availability: commercial quantities. American Cyanamid, Fine Chemicals Div.

#### CHLOROMETHYL ALKYL BENZENES

$C_6H_5CH_2Cl$  and  $C_{10}H_{13}CH_2Cl$ . Constituents: chloromethyl alkylbenzenes from  $C_9$  and  $C_{10}$  hydrocarbons. M.W., 175 (average); Sp.G., 1.04 at 25 C; M.P., viscous at -60 C; B.P., 125 to 175 C at 50 mm. Hg. Aliphatic chlorine, 19.5 to 22%. Purity: completely aromatic; Solubility: soluble in all common organic solvents; insoluble in water. Chemical properties: colorless to yellow-tinted liquid; very reactive; esters and other derivatives are formed rapidly in high yields; the alkyl groups present will give products of lower volatility than the related compounds prepared from benzyl chloride; skin and eye irritant. Suggested uses: chemical intermediate; esters for plasticizers and perfumes; alkylbenzyl alcohol for solvent; quaternary compounds for surfactants and germicides. Introduced as: new chemical product. Availability: semicommercial quantities (limited). International Minerals and Chemical Corp., Research Div.

#### α-CHLORO METHYL NAPHTHALENE 1-(chloromethyl) (naphthalene)

$C_{11}H_9Cl$ ; M.W., 176.64; Sp.G., 1.182 at 25/25 C; Coagulation Pt., 19.8 C; Purity: 96.5%; Solubility: insoluble in water; soluble in esters, hydrocarbons, etc. Chemical properties: colorless to greenish-yellow liquid with a sharp pungent odor; a lachrimator; chlorine is extremely reactive and undergoes the usual reactions. Suggested uses: as an intermediate in manufacture of germicidal quaternaries, plant growth hormones, etc. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### CHLOROMETHYLNAPHTHALENES

$CH_3C_{10}H_6CH_2Cl$  and  $(CH_3)_2C_{10}H_5CH_2Cl$ . Constituents: Chloromethylnaphthalenes from methyl- and dimethylnaphthalenes. M.W., 210 (average); Sp.Gr., 1.2 at 25 C; M.P., viscous at -35 C; B.P., 145 to 200 C at 5 mm. Hg.; aliphatic chlorine, 15 to 18%. Purity: completely aromatic; Solubility: soluble in most common organic solvents; insoluble in methyl alcohol and water. Chemical properties: greenish-yellow liquid; very reactive; esters and other derivatives are formed rapidly in high yields; skin and eye irritant. Suggested uses: chemical intermediate to make functional fluids, lubricant additives, pesticides, plasticizers, etc. Introduced as: new chemical product. Availability: semicom-



# 437 NEW CHEMICALS FOR INDUSTRY

mercial quantities (limited). International Minerals and Chemical Corp., Research Div.

## 2-CHLORO-5-NITROBENZOTRIFLUORIDE

$C_7H_3O_2NClF_3$ ; Constituents: contains approx. 30% 2-chloro-5-nitrobenzotrifluoride. M.W. 226; B.P., 100-105 °C/5mm.; Purity: approx. 70%. Solubility: soluble in aromatic and other polar solvents. Suggested uses: pharmaceutical, agriculture chemical, and dyestuff intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Maumee Chemical Co.

## 5-CHLORO-2-NITROBENZOTRIFLUORIDE

$C_7H_3O_2NClF_3$ ; Constituents: contains approx. 35% other isomers. M.W., 226; B.P., 214-234 °C; Purity: approx. 65%; Solubility: soluble in aromatic and other polar solvents. Suggested uses: pharmaceutical, agricultural chemical, and dyestuff intermediate. Introduced as: new chemical product. Availability: semicommercial quantities. Maumee Chemical Co.

## $\alpha$ -CHLOROPROPIONIC ACID (2-chloropropionic acid)

$C_3H_5O_2Cl$ ; M.W., 108.5; Sp.G., 1.260-1.268 at 20 °C; B.P., 183-187 °C; Purity: 96% min.; Solubility: soluble in water. Suggested uses: intermediate in weed killers such as phenoxy propionic compounds. Introduced as: product with new degree of availability. Availability: commercial quantities. Aceto Chemical Co., Inc.

## $\beta$ -CHLOROPROPIONIC ACID

$C_3H_5O_2Cl$ ; M.W., 108.53; M.P., 41 °C (Corr.); Purity: 95% min.; Solubility: freely soluble in water, alcohol, chloroform, slightly soluble in ether. Introduced as: product with new degree of availability. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

## CHROMIC CHLORIDE, ANHYDROUS

$CrCl_3$ ; M.W., 158.38; Sp.G., 2.916; Sublimation Pt., 947 °C; Purity: 98%  $CrCl_3$  mm. (tentative); Solubility: insoluble in water and organic solvents; solubilized by addition of reducing agents. Chemical properties: excellent stability; unusual solubility characteristics. Suggested uses: chromizing, vapor plating, flame metallizing, catalyst, organic chromium compounds, tanning agent, heat sensitive inks, high purity chromium metal, impregnant for textiles and plastics. Introduced as: significantly new grade, product with new degree of availability. Availability: semicommercial quantities. Diamond Alkali Co., Research Dept., Product Development.

## CHROMIC CHLORIDE, 40% BASIC

$Cr_2(OH)_4Cl_2 \cdot 12H_2O$ ; M.W., 89.4; Sp.G., 1.70; M.P., decomposes. Solubility: readily soluble in water, methanol, ethanol, acetone. Chemical properties: typical sample contains 29% chromium. Suggested uses: intermediate for manufacture of chromium compounds; mordant in dyeing and printing of textiles; solvent tanning of leather. Introduced as: significantly new grade, product with new degree of availability. Availability: semicommercial quantities. Diamond Alkali Co., Research Dept., Product Development.

## CHROMIUM ACETYLACETONATE (chromic acetylacetonate)

$Cr(C_5H_7O_2)_3$ ; M.W., 349; M.P., 216 °C; Sp.G., 1.34; B.P., near 340 °C; Solubility: slightly soluble in water (0.15 g./100g. at 30 °C); soluble in organics (g./100g. at 30 °C: benzene, 34.0; toluene 13.6; xylene 5.03). Chemical properties: red-violet, monoclinic crystalline powder; % metal typical 14.6; oil and organic soluble. Good means of introducing metal into organics; stable in air. Suggested uses: stabilizer for nitro paraffins; same uses as ferric acetylacetonate, q.v. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Co., Div. Union Carbide Corp.

## CIS-4<sup>®</sup> RUBBER (cis-1,4-polybutadiene)

$(C_4H_6)_n$ ; Constituents: cis content, at least 94.5%; ash, 0.50 max.; volatile matter, 0.75 max. Sp.G., 0.91; ML-4 (212 F), 40-50; Chemical properties: high resilience, low hysteresis and high abrasion resistance in tread compounds. Suggested uses: tire treads and various

mechanical items requiring high resilience or abrasion resistance. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Phillips Chemical Co., Rubber Chemicals Div.

## COBALT ACETYLACETONATE (cobaltic acetylacetonate)

$Co(C_5H_7O_2)_3$ ; M.W., 356; M.P., 240 °C; Sp.G., 1.43; B.P., decomposes before boiling; Solubility (g./100 g. at 30 °C): water, <0.3; benzene, 16.3; heptane, 0.031; xylene, 1.90. Chemical properties: dark green, monoclinic crystalline powder, 16.6% metal; stable in air, oil, and organic solvents; good means of introducing metal into organics. Suggested uses: same as ferric acetylacetonate, q.v. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

## CONOCO DBCL (dodecylbenzyl chloride)

$C_{10}H_{21}Cl$ ; M.W., 292 (apparent); Sp.G., at 60 °F, 0.965; Solubility: soluble in most organic solvents. Chemical properties: 90% minimum activity; average chlorine content, 11.4-11.8%. Suggested uses: intermediate for cationic detergents. Introduced as: new chemical product. Availability: commercial quantities. Continental Oil Co., Petrochemical Div.

## CONOCO DEMIVIS

Constituents: synthetic calcium sulfonate in a plasticized system. Sp.G., 0.937; Suggested uses: synergist for chemical-blown vinyl foam where foaming is accomplished before gelation. Introduced as: new chemical product. Availability: commercial quantities. Continental Oil Co., Petrochemical Dept.

## COPPER ACETYLACETONATE (cupric acetylacetonate)

$Cu(C_5H_7O_2)_2$ ; M.W., 261.75; M.P., >230 °C; B.P., decomposes above 240 °C; Solubility: slightly soluble in water; soluble in organic solvents. Chemical properties: blue crystalline powder, 24.2% metal; stable in air; organic soluble, good means of introducing metal into organics. Suggested uses: fungicide, insecticide, metal deposition, and same uses as ferric acetylacetonate, q.v. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

## CYCLOPENTENYL ACETONE

### [1-(1-cyclopentenyl)-2-propanone]

$C_8H_{12}O$ ; M.W., 124.18; B.P., 170 °C; R.I., 1.4545-1.4550 at 25 °C; Purity: 95% min.; Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

## CYCLOPENTYL ACETONE

### (1-cyclopentyl-2-propanone)

$C_8H_{16}O$ ; M.W., 126.18; Sp.G., 0.893 at 25/25 °C; B.P., 180-184 °C; R.I., 1.4420 at 25 °C; Purity: 95% min. Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

## DABCO (1,4-diazabicyclo(2.2.2)octane)

$C_4H_{12}N_2$ ; M.W., 112.17; M.P., 158 °C; B.P., 174 °C; Purity: 98% min.; Chemical properties: hygroscopic, forms a crystalline hydrate; sublimes easily; soluble in water and organic solvents. Suggested uses: "one-shot" catalyst for production of polyether-type urethane foams; catalyst for urethane coatings and elastomers; chemical intermediate. Introduced as: product with new degree of availability. Availability: commercial quantities. Houdry Process Corp., Sales & Services Div.

## DELAMIN P

$C_{18}H_{33}$  = 37NH<sub>2</sub>; Constituents: a mixture of oleylamine, stearylamine and linoleylamine. M.W., aver. 280; Sp.G., 0.8684 at 25/4 °C; M.P., 58 °C; B.P., 145-200 °C at 4 mm. Hg; Purity: 90% total amine, 85% primary amine; Solubility: insoluble in water; soluble in aliphatic, aromatic, and terpene hydrocarbons; soluble in alcohols, ketones, ethers, and halogenated solvents. Chemical properties: derived solely from eighteen-carbon fatty acids; high primary amine content. Suggested uses: for synthesis of compounds in fields such as pharmaceuticals, insecticides, disinfectants and preservatives. Introduced as: new chemical product. Availability: commercial quantities. Hercules Powder Co., Inc., Naval Stores Dept.

## DELAMIN PD

$C_{18}H_{33}$  = 37NH<sub>2</sub>; Constituents: a mixture of oleylamine, stearylamine and linoleylamine. M.W., aver. 270; Sp.G., 0.8694 at 25/4 °C; M.P., 59 °C; B.P., 179-183 °C at 4 mm. Hg; Purity: 96% total amine, 95% primary amine;

Solubility: insoluble in water; soluble in aliphatic, aromatic, and terpene hydrocarbons; soluble in alcohols; ketones, ethers, and halogenated solvents. Chemical properties: derived solely from eighteen-carbon fatty acids; high primary amine content. Suggested uses: for synthesis of compounds in fields such as pharmaceuticals, insecticides, disinfectants, and preservatives. Introduced as: new chemical product. Availability: commercial quantities. Hercules Powder Co., Inc., Naval Stores Dept.

## DEN (DOW EPOXY NOVOLAC) 438 (PLUS A-85 AND EK-85 SOLVENT SOLUTIONS)

Epoxide Equivalent Wt. (Dow Method AS-EPR-A1) = 175-182. Viscosity: (Test Method, Brookfield Model LVT, #4 Spindle at 6 rpm) = 30,000-90,000 cps at 125 °C. Suggested uses: prepreg laminates, castings, adhesives, coatings; wherever conventional epoxies now serve, providing markedly improved high temperature service. Introduced as: new chemical product. Availability: commercial quantities. The Dow Chemical Co., Plastic Dept.

## DEOXYANISOLIN [4'-methoxy-2-(p-methoxyphenyl) acetophenone]

$C_{16}H_{16}O_3$ ; M.W., 256.29; M.P., 110-112 °C; Moisture, not more than 1%. Purity: 95% min. Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

## DIAZOPON SS-837

Solubility: readily soluble in cold water—no cloud point. Chemical properties: nonionic, high molecular weight condensation product; stable to acids, alkalis and metallic ions. Suggested uses: stabilizer for naphthol dye baths, soaping agent for naphthol dyes, leveling assistant for neutral-premetallized and milling dyes, dyeing assistant for vatdye and disperse color dyeing and also in dyeing nylon. Introduced as: new chemical product. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Div.

## N,N'-DIBENZYL-DITHIOXAMIDE

$(C_6H_5CH_2NHCS)_2$ ; M.W., 300.1; M.P., 109.0-110.8 °C; Solubility: 0.14 g./100 ml. water; 5.2 g./100 ml. benzene; 15.9 g./100 ml. chloroform. Chemical properties: gold colored powder; forms highly stable, colored complexes with many metal ions, condensation reactions with amines, cyclization with  $\alpha$ -halo carbonyl compounds. Suggested uses: pigments, metal deactivators, chemical intermediates, plant growth regulator, analytical reagent and rodent repellent. Introduced as: new chemical product. Availability: developmental quantities. Mallinckrodt Chemical Works.

## 3,5-DIBUTYL PYRADINE

M.W., 191.306; Sp.G., 0.882; B.P., 271 °C at 760 mm. Hg. Fr. Pt., < -75 °C; Flash Pt., 252°F; R.I., n<sub>D</sub>20, 1.4860. Purity: 95%. Solubility: in water at 20 °C, 0.3%; water in at 20 °C, 1.8%. Chemical properties: undergoes reactions typical of tertiary amines; acute oral LD 50 is approx. 3.0 g./kg.; exposure or prolonged breathing of vapor should be avoided. Suggested uses: heat transfer medium. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansul Chemical, Market R & D.

## 4,6-DICHLORO-5-AMINOPYRIMIDINE

$C_4H_3N_3Cl_2$ ; M.W., 164; M.P., 145-146 °C. Purity: reagent grade. Suggested uses: intermediate, possibly for application in cancer research. Introduced as: new chemical product. Availability: laboratory quantities. Krishell Laboratories, Inc.

## 1,2-DICHLOROETHANE

$ClCH_2CH_2Cl$ ; M.W., 98.97; Sp.G., 1.2455; B.P., 83-85 °C; U.V. Cut-Off, 233 m $\mu$ . Solubility: soluble in about 120 parts water; miscible with ethanol, chloroform, and ether; solvent for fats, oils, waxes and gums. Suggested uses: useful solvent for both U.V. and infra-red spectroscopy. Introduced as: significantly new grade. Availability: semicommercial quantities. The Matheson Co., Inc., Matheson Coleman & Bell Div.

## N,N'-DICYCLOHEXYLDITHIOXAMIDE

$(C_6H_{11}NHCS)_2$ ; M.W., 284.5; M.P., 146.3-148.0 °C. Solubility: 8.5 g./100 ml. benzene; 24.4 g./100 ml. chloroform; 0.34 g./100 ml. methanol. Chemical properties: bright orange-red powder; forms highly stable, colored complexes with many metal ions, condensation reactions with amines, cyclization with  $\alpha$ -halo carbonyl compounds. Suggested uses: pigments, metal deactivators, chemical intermediates, plant growth regulators, analytical reagent and rodent



repellents. Introduced as: new chemical product. Availability: developmental quantities. Mallinckrodt Chemical Works.

#### N,N'-DIDODECYLDITHIOXAMIDE

(C<sub>12</sub>H<sub>25</sub>NHCS)<sub>2</sub>; M.W., 456.8; M.P., 49.8-51.8 C; Solubility: 0.06 gm./100 ml. water; 57.0 gm./100 ml. carbon disulfide; 53.0 gm./100 ml. chloroform. Chemical properties: straw colored powder; forms highly stable, colored complexes with many metal ions, condensation reactions with amines, cyclization with  $\alpha$ -halo carbonyl compounds. Suggested uses: pigments, metal deactivators, chemical intermediates, plant growth regulators, analytical reagent and rodent repellents. Introduced as: new chemical product. Availability: developmental quantities. Mallinckrodt Chemical Works.

#### DIEPOXIDE AG-13E

(bis-epoxydicyclopentyl ether of ethylene glycol)

C<sub>22</sub>H<sub>30</sub>O<sub>4</sub>; M.W., 358.4; M.P., 30-70 C; B.P., 240-250 C at 1 mm.; Solubility: soluble in organic solvents, such as toluene, ethylene dichloride, acetone, hexane and methanol. Chemical properties: will react with polyhydroxy compounds to form polyethers and with polybasic acids to form half esters of a glycol. Suggested uses: may be useful as an intermediate for clear, hard thermosetting resins; has potential application as a stabilizer and plasticizer for polymers and as a crosslinking agent for polyesters. Introduced as: new chemical product. Availability: semicommercial quantities. Rohm & Haas Co., Special Products Dept.

#### DIETHYL FUMARATE

C<sub>8</sub>H<sub>12</sub>O<sub>4</sub>; M.W., 172.18; Sp.G., 1.0487 25/25; M.P., 0.6 C; B.P., 218 C at 760 mm. Purity: 99.4%. Suggested uses: modifying comonomer for vinyl polymer systems; chemical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Monsanto Chemical Co., Organic Div.

#### DI-2-ETHYLHEXYL FUMARATE

C<sub>20</sub>H<sub>34</sub>O<sub>4</sub>; M.W., 340.5; Sp.G., 0.942; B.P., 216 C. Purity: 99.4%. Suggested uses: as a monomer and comonomer for resins for surface coatings, textile finishes and molding compounds. Introduced as: new chemical product. Availability: laboratory quantities. Monsanto Chemical Co., Organic Div.

#### O,O-DIETHYL PHOSPHOROCHLORIDOTHIOATE

C<sub>4</sub>H<sub>10</sub>ClO<sub>2</sub>PS. M.W., 188.5; Sp.G., 1.196  $\pm$  0.005 at 25/25 C; R.I., n<sub>D</sub><sup>20</sup>, 1.4705  $\pm$  0.0015. Purity: assay 97% (min.). Suggested uses: intermediate for biological toxicants. Introduced as: product with new degree of availability. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

#### QO DIHYDROPYRAN

(2,3-dihydro-4-H-pyran)

C<sub>5</sub>H<sub>8</sub>O; M.W., 84.11; Sp.G., 0.927 at 20/4 C; M.P., -70 C; B.P., 84.3 C at 760 mm. Solubility: 25 C, 1.6 g./100 g. in water; water in, 0.5 g./100 g. Chemical properties: exhibits properties of a vinyl ether; adds hydrochloric and hydrobromic acids to form the corresponding 2-halotetrahydropyran. Alcohols add readily to the double bond in the presence of acids, thus addition of methanol forms 2-methoxytetrahydropyran, an acetal from which the alcohol may be readily regenerated by hydrolysis, affording a method of protecting alcohol groups during reactions. Reactions of dihydropyran with water in the presence of acid or an acidic ion exchange resin result in 2-hydroxytetrahydropyran, the cyclic form of  $\delta$ -hydroxypentanol. Suggested uses: chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. The Quaker Oats Co., Chemicals Div.

#### 3,4-DIMETHYL BENZYL CHLORIDES (MIXED ISOMERS)

(3,4-dimethyl  $\alpha$ -chlorotoluenes)

(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>CH<sub>2</sub>Cl; Constituents: 73% 3,4-; 24% 2,3-; 3% 2,4- and 1% 2,6-dimethyl benzyl chlorides. M.W., 154.64; Sp.G., 1.0594-1.062 at 25/25 C; B.P., 95% distills between 222-228 C; R.I., n<sub>D</sub><sup>20</sup>, 1.5375-1.5395. Purity: 99%; Solubility: soluble in alcohols and ethers; immiscible with water. Chemical properties: colorless to pale yellow liquid, sharp pungent odor, a lacrimator; reactive chlorine may be replaced by a nitrile group, the nitrile group converted to an ester, acid or amide. Suggested uses: valuable intermediate for preparation of pharmaceuticals, dyestuffs, perfume bases, wetting agents, resins, germicides, rubber accelerators, gasoline gum inhibitors, etc. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### DIMETHYL CHLOROACETAL (chloroacetaldehyde dimethyl acetal)

C<sub>4</sub>H<sub>8</sub>ClO<sub>2</sub>; M.W., 124.57; Sp.G., 1.0852-1.0952 at 25/25 C; B.P., 126-132 C; R.I., 1.4110-1.4135 at 25 C; Purity: 97%. Suggested uses: organic synthesis; pharmaceuticals; as a solvent. Introduced as: product with new degree of availability. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

#### N,N'-DIMETHYLDITHIOXAMIDE

(CH<sub>3</sub>NHCS)<sub>2</sub>; M.W., 148.2; M.P., 137.1-138.1 C; Solubility: 0.13 gm./100 ml. water; 6.6 gm./100 ml. benzene; 14.9 gm./100 ml. chloroform. Chemical properties: bright yellow powder; forms highly stable, colored complexes with many metal ions, condensation reactions with amines, cyclization with  $\alpha$ -halo carbonyl compounds. Suggested uses: pigments, metal deactivators, chemical intermediates, plant growth regulator, analytical reagent and rodent repellents. Introduced as: new chemical product. Availability: developmental quantities. Mallinckrodt Chemical Works.

#### DIMETHYL FUMARATE

C<sub>8</sub>H<sub>12</sub>O<sub>4</sub>; M.W., 144.12; M.P., 101.6 C; B.P., 192 C at mm. Hg. Purity: 99.4%. Suggested uses: modifying comonomer for vinyl systems; chemical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Monsanto Chemical Co., Organic Div.

#### 2,2-DIMETHYLPENTANOL

C<sub>7</sub>H<sub>16</sub>O; M.W., 116.2; Density, 0.825 at 20 C; B.P., 150 C at 760 mm. Flash Pt. (Cleveland Open Cup), 135 F; R.I., (n<sub>D</sub><sup>20</sup>), 1.4256. Chemical properties: the absence of  $\beta$ -hydrogen atoms results in good stability to dehydration. Suggested uses: terminating agent for polyesters and in other reactions where dehydration might be a problem. Introduced as: new chemical product. Availability: laboratory quantities. Eastman Chemical Products, Inc., Chemicals Div.

#### 2,4-DIMETHYLPENTANOL

C<sub>7</sub>H<sub>16</sub>O; Constituents: 2,4-dimethylpentanol 86.5%; 2-methylpentanol, 12.9%; high and low boilers, 0.6%. M.W., 116.2; Sp.G., 0.8203 at 20/20 C; B.P., 155.4-159.7 C at 760 mm.; Flash Pt. (Tag Open Cup), 140 F; R.I., (n<sub>D</sub><sup>20</sup>), 1.422. Solubility: miscible with acetone, ethanol, chloroform, heptane, and ether. Chemical properties: has only one  $\beta$ -hydrogen atom, which contributes to good dehydration stability. Suggested uses: terminating agent for polyesters; chemical intermediate in the manufacture of plasticizers and herbicides; specialty solvent. Introduced as: new chemical product. Availability: laboratory quantities. Eastman Chemical Products, Inc., Chemicals Div.

#### N,N-DIMETHYLPHOSPHORAMIDIC DICHLORIDE

M.W., 162.0; B.P., 46 C at 1 mm.; Solubility: soluble in benzene, toluene, hexane, chloroform, carbon tetrachloride. R.I., n<sub>D</sub><sup>20</sup>, 1.4609. Chemical properties: acid chloride, water white liquid. Suggested uses: insecticide intermediate. Introduced as: new chemical product. Availability: semicommercial quantities. Victor Chemical Works Div., Stauffer Chemical Co.

#### O,O-DIMETHYL PHOSPHOROCHLORIDOTHIOATE

C<sub>4</sub>H<sub>10</sub>ClO<sub>2</sub>PS. M.W., 160.5; Sp.G., 1.314  $\pm$  0.005 at 25/25 C; R.I., n<sub>D</sub><sup>20</sup>, 1.4795  $\pm$  0.005. Purity: assay 96% (min.). Suggested uses: intermediate for biological toxicants. Introduced as: product with new degree of availability. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

#### DINITRO DPA

(4,4-bis-(3-nitro-4-hydroxyphenyl)pentanolic acid)

CH<sub>3</sub>C(CH<sub>2</sub>NO<sub>2</sub>)<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>COOH; M.W., 376 theoretical; M.P., 137-140 C; Neut. Eq., 126.1. Solubility: 95% soluble in ethanol. Chemical properties: appearance—light yellow crystals. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. S. C. Johnson & Son, Inc., Service Products Div.

#### DIPHENYLPHOSPHINOUS CHLORIDE (diphenyl chlorophosphine)

M.W., 220.6; B.P., b<sub>760</sub> mm., 320 C; b<sub>1</sub> mm., 100-102 C; Solubility: soluble in common organic solvents, reacts violently with water, alcohols, amines, d<sub>25</sub>, 1.19 g./ml., n<sub>D</sub><sup>25</sup>, 1.6342. Chemical properties: hydrolyzes and disproportionates in water or alcohols to form diphenylphosphinic acid and diphenylphosphine; reacts with alcohols in presence of tertiary amines to form alkyl diphenylphosphinites; can be oxidized

to diphenylphosphinic chloride, or (with sulfur) diphenylphosphinothioic chloride. Suggested uses: chemical intermediate; end products may be useful as stabilizers, antioxidants, high polymers, plasticizers, oil additives, etc. Introduced as: new chemical product. Availability: semicommercial quantities. Victor Chemical Works Div., Stauffer Chemical Co.

#### 3,5-DIPHENYL PYRIDINE

M.W., 231.29; M.P., 137 C; Solubility: nil. Chemical properties: toxicity unknown, recommend caution. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansel Chemical, Market R & D.

#### S tert-DODECYLTHIOGLYCOLIC ACID

C<sub>14</sub>H<sub>28</sub>O<sub>2</sub>S; M.W., approx. 260; Sp.G., 20/4 0.9718; B.R., 80-189 at 5 mm. Hg. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Phillips Petroleum Co., Market Development Div.

#### DOW BADISCHE ACRYLIC ACID, TECHNICAL GRADE (INHIBITED)

CH<sub>2</sub>=CH—CO<sub>2</sub>H; M.W., 72.03; Sp.G., at 25 C, 1.049; M.P., 8.0 C; B.P., 141 C at 760 mm. Hg. Purity: (when shipped) by bromination, 94.7%, by acid number, 97.0% (typical). Viscosity at 20 C, 1.66 cps. Chemical properties: monomethyl ether of hydroquinone (MEHQ), 0.1%; Dow Badische Acrylic Acid (produced by Dow Badische Chemical Co. and sold by Dow Chemical Co.) is adaptable to esterification reactions of the carboxylic acid and the polymerization and addition reactions of the reactive double bond. Suggested uses: acrylic acid is widely used in the preparation of three types of resinous polymers and copolymers—polyacrylics and high acrylic acid content polymers, medium acrylic acid content polymers, low acrylic acid content polymers. Introduced as: significantly new grade. Availability: commercial quantities. The Dow Chemical Co., Plastics Dept.

#### DOW CORNING Z-6020

Sp.G., 1.03-1.06 at 25 C; Solubility: excellent in water and alcohols; fair in aromatic hydrocarbons; poor in aliphatic hydrocarbons, ketones and esters. Chemical properties: an amino-functional silane having the ability to couple organic and inorganic materials. Suggested uses: coupling agent between glass wool and organic resins; glass cloth and phenolic, epoxy, or melamine resins; dyeing aid for glass cloth, Orlon, Dacron; dispersing agents for pigments, cements, clays and metallic oxides; curing agent for epoxy resins. Introduced as: product with new degree of availability. Availability: commercial quantities. Dow Corning Corp.

#### DOWEX A-1 CHELATING RESIN

Constituents: a styrene-divinylbenzene copolymer matrix within which are attached iminodiacetate active groups. Available in spherical beads in a nominal 50-100 mesh range. Chemical properties: a cation exchange resin with unusually high selectivity for heavy metal ions. Suggested uses: removal of heavy metal ions from concentrated solutions of alkaline or alkaline earth metal salts; removal of alkaline earth cations from concentrated solutions of alkali metal cations; separation of mixtures of heavy metal ions. Introduced as: new chemical product. Availability: semicommercial quantities. The Dow Chemical Co., Technical Service and Development Div.

#### DOWFAX 2A1

(sodium dodecylphenyl oxide disulfonate) Mainly C<sub>12</sub>H<sub>25</sub>O(SO<sub>3</sub>)<sub>2</sub>Na<sub>2</sub>; M.W., approx. 525; Sp.G. (of 45% soln.), approximately 1.1; M.P., decomposes at about 150 C; Dry form, 90% min. active; Solution, 45% min. active. Solubility: approx. 300 gms. in 100 gms. water. Chemical properties: very soluble in concentrated electrolytes and strong acids and bases; hydrotropic; stable to oxidation; good detergent; readily defoamed or foam boosted. Suggested uses: detergent sanitizers, alkaline or acidic cleaners, metal cleaning and treating, bottle washing, machine dishwashing, concentrated liquid detergents, all-purpose surfactant. Introduced as: product with new degree of availability. Availability: commercial quantities. The Dow Chemical Co., Technical Service and Development Div.

#### DOW LATEX 5282

(vinyltoluene/butadiene copolymer)

Sp.G., 0.981 at 25 C; Percent Solids: (Test Method, Dow AS-DL-A) = 47.0  $\pm$  1.5%; pH (Test Method, Dow AS-DL-E) = 10.5  $\pm$  0.5 (as shipped). Suggested uses: low staining, light colored, age-resistant vulcanizates for textile applications—rug backing, upholstery backing, and hair pad and scrap foam binders. Introduced

# 437 NEW CHEMICALS FOR INDUSTRY

as: new chemical product. Availability: commercial quantities. The Dow Chemical Co., Plastics Dept.

## DOW LATEX 2647 (ACRYLIC LATEX)

Sp.G., Polymer, 1.15; Latex, 1.07-1.08; Weight Per Gal., 8.88-8.93; Per Cent Solids, (Test Method: Dow AS-DL-A), 47.0  $\pm$  1.0%, pH (Test Method: Dow AS-DL-E), 8.5  $\pm$  0.5 (as shipped). Suggested uses: paint, textile, paper, and building products applications; particular promise in the formulation of latex paints over exterior wood. Introduced as: new chemical product. Availability: commercial quantities. The Dow Chemical Co., Plastic Dept.

## DOW POLYETHYLENE 775E

Sp.G., 0.928; Vicat Softening Point, 200-210 F. Chemical properties: film extrusion resin characterized by excellent clarity, gloss and stiffness; outstanding drawdown properties, high slip, superior antiblocking qualities. Suggested uses: developed primarily for the thin gauge polyethylene film field (garment bags, shirt bags, individual lettuce bags, etc.). Introduced as: new chemical product. Availability: commercial quantities. The Dow Chemical Co., Plastics Dept.

## DOW PVC-166 RESIN (polyvinyl chloride)

Sp.G., 1.4 (typical value); Absolute Viscosity (2%  $\sigma$ -dichlorobenzene at 120°C), Range = 1.15 to 1.35. Chemical properties: has the lowest molecular weight range of all polyvinyl chloride homopolymers; main chain physical and heat stability characteristics typical of the unmodified vinyls. Suggested uses: suitable for calendaring, extrusion and molding operations, particularly in rigid and semi-rigid applications. Introduced as: new chemical product. Availability: commercial quantities. The Dow Chemical Co., Plastics Dept.

## DRI-DIE INSECTICIDE 67

Constituents: 95.3% silica gel impregnated with 4.7% ammonium fluosilicate. Chemical properties: kills insects by a physical-chemical action. Suggested uses: for structural pest control of roaches, fleas, dry-wood termites, bed bugs, silverfish, etc. Introduced as: new chemical product. Availability: commercial quantities. W. R. Grace & Co., Davison Chemical Co. Div.

## DROXOL B (bis-2-beta-hydroxyethoxy-5-octylphenyl methane)

$C_{23}H_{32}O_4$ ; M.W., 528; Sp.G., 0.990 at 25°C; Solubility: soluble in most common aliphatic and aromatic solvents. Chemical properties: confers superior water and alkali resistance, improved flexibility, and more universal solubility on coating formulations. Suggested uses: intermediate for making alkyds, unsaturated polyesters, and epoxy resin esters. Introduced as: new chemical product. Availability: semicommercial quantities. Nopco Chemical Co., Chemical Development Div.

## DX-840 (water soluble ethylene-maleic anhydride copolymers)

Chemical properties: as a base copolymer, because of its polyanhydride structure, serves as a building block for chemical synthesis; a wide range of derivatives, such as transparent film formers, polymeric liquids, waxy solids and polyampholytes can be prepared by proper choice of reactants; furnished either as an anhydride, free acid or amide-ammonium salt; available in three molecular weights—low, intermediate and high—as fine, free-flowing white powder. Suggested uses: adhesives, dispersants, suspending agents, controlling crystal formation, foundry resins, surface coatings, textile sizing and thickeners for aqueous systems, such as water-based paints and cosmetics. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co.

## EMCOL H-2A (complex amine sulfonate)

Chemical properties: emulsifier having high tolerance to salts in aqueous solution. Suggested uses: liquid pesticide emulsifiable concentrates for mixing with liquid fertilizer. Introduced as: new chemical product. Availability: commercial quantities. Witco Chemical Co., Inc., Organic Div.

## EPOLENE HD (low-molecular-weight polyethylene)

M.W., 1500; Density, 0.938; Softening Pt., 112-114°C; Flash Pt., >600°F; Viscosity (Brookfield), 340 cp. at 120°C; Saponification No., <0.1. Purity: 100%; Solubility: readily soluble in both aliphatic and aromatic hydrocarbons at temperatures above 180°F. Chemical properties: extreme hardness permits it to be ground into a fine dispersion; high density; low viscosity. Suggested uses: increase the melting point of other waxes in blends; useful in printing inks. Introduced as: new chemical product. Availability: commercial quantities. Eastman Chemical Products, Inc., Chemicals Div.

## EPOLENE HDE (emulsifiable, low-molecular-weight polyethylene)

M.W., 1500; Density, 0.956; Softening Pt., 110-111°C; Flash Pt., >600°F; Viscosity (Brookfield), 455 cp. at 120°C; Saponification Number, 25-30. Purity: 100%; Solubility: readily soluble in both aliphatic and aromatic hydrocarbons at temperatures above 180°F. Chemical properties: emulsifiable by standard methods; produces hard film; more compatible with oleic acid than regular emulsifiable polyethylene. Suggested uses: floor waxes. Introduced as: new chemical product. Availability: commercial quantities. Eastman Chemical Products, Inc., Chemicals Div.

## EPOLENE LV (low-molecular-weight polyethylene)

M.W., 1500 (approx.); Density, 0.925; Softening Pt., 103-104°C; Flash Pt., >600°F; Viscosity (Brookfield), 360 cp. at 120°C; Saponification Number, 360. Purity: 100%; Solubility: readily soluble in both aliphatic and aromatic hydrocarbons at temperatures above 180°F. Chemical properties: compatible with a large number of natural and synthetic waxes and resins; has a low melt viscosity. Suggested uses: injection molding, calendar release agent in the milling of rubber; may be used in small concentrations to increase the gloss, flexibility and blocking resistance of paraffin wax. Introduced as: new chemical product. Availability: commercial quantities. Eastman Chemical Products, Inc., Chemicals Div.

## EPOLENE LVE (emulsifiable, low-molecular-weight polyethylene)

M.W., 1500; Density, 0.939; Softening Pt., 104-105°C; Flash Pt., >600°F; Viscosity (Brookfield), 400 cp. at 120°C; Saponification Number, 25-30. Purity: 100%; Solubility: readily soluble in both aliphatic and aromatic hydrocarbons at temperatures above 180°F. Chemical properties: emulsifiable, has good antislip properties, good rebufferability. Suggested uses: floor polishes, textile softeners, sizing agents, emulsion paper coatings; in plastic formulations, it prevents sticking during calendaring, and acts as a lubricant in extrusion. Introduced as: new chemical product. Availability: commercial quantities. Eastman Chemical Products, Inc., Chemicals Div.

## EPON® X-71

Sp.G., 8.2 lb./gal. at 68°F; Viscosity, 470-520 cps. at 25°C; Gardner Color, 10-11; Epoxide Equivalent, 390-400. Chemical properties: a honey-like liquid diepoxide used to flexibilize epoxy resin formulations. Suggested uses: flexibilizer. Introduced as: new chemical product. Availability: semicommercial quantities. Shell Chemical Corp., Plastics & Resins Div.

## EPOTUF 6150 (liquid epoxy resin)

Sp.G., 9.99 lbs./gal.; Viscosity, 5000 cps.; Epoxide Equiv., 350-400; Hydrolyzable Chlorine, 0.1% max.; Gardner Color, 8 max. Chemical properties: intermediate viscosity liquid epoxy resin; flexibility and resiliency of cured resins made with EPOTUF 6150 are easily controlled; room-temperature cure and/or cure with heat are possible. Suggested uses: recommended for casting, laminating, encapsulating and other epoxy resin applications requiring a specific degree of resiliency and high impact resistance. Introduced as: new chemical product. Reichhold Chemicals, Inc.

## EPOTUF HARDENERS EH-30-1 AND EH-30-3 (modified amine-type epoxy curing agents)

Sp.G., 8.1 lbs./gal.; Viscosity, 250 cps. (EH-30-1), 4000 cps. (EH-30-3); Pot Life, 8 min. (120 gm. mass). Solubility: infinitely soluble in one another; can be blended as desired. Chemical properties: light amber colored liquid; castings made with EH-30-1 as the curing agent have a high degree of resiliency; those made with EH-30-3 are tough and highly flexible; blends achieve intermediate properties. Suggested uses: for epoxy castings, potting, patching compounds, adhesives and all room-

temperature applications requiring good electrical properties and flexibility or resiliency in the cured epoxy. Introduced as: new chemical product. Reichhold Chemicals, Inc.

## EPTAM® ANALOG R-1607 (propyl ethyl-n-butylthiol carbamate)

M.W., 203.4; B.P., 140.0°C at 20 mm. Hg;  $n_{D^{20}}$ , 1.4736;  $d_{4^{20}}$ , 0.9440. Chemical properties: herbicidal activity similar to Eptam (commercial selective herbicide possessing a broad spectrum weed activity and crop selectivity) but with marked differences in crop tolerances; it is suggested that rates of 2-6 #/acre be tested for control of annual grassy and broadleaf weeds; for the control of perennials such as nutgrass, quack grass and Johnson grass, rates of 3-10 #/acre are suggested. Suggested uses: herbicide. Introduced as: new chemical product. Availability: laboratory quantities. Stauffer Chemical Co., Agricultural Chemical Div.

## EPTAM® ANALOG R-2060 (ethyl ethyl-n-butylthiol carbamate)

M.W., 189.3; B.P., 129.0°C at 20 mm. Hg;  $n_{D^{20}}$ , 1.4756;  $d_{4^{20}}$ , 0.9558. Chemical properties: see R-1607. Suggested uses: see R-1607. Introduced as: new chemical product. Availability: laboratory quantities. Stauffer Chemical Co., Agricultural Chemical Div.

## EPTAM® ANALOG R-2061 (propyl ethyl-n-butylthiol carbamate)

M.W., 203.4; B.P., 142.5°C at 20 mm. Hg;  $n_{D^{20}}$ , 1.4752;  $d_{4^{20}}$ , 0.9458. Chemical properties: see R-1607. Suggested uses: see R-1607. Introduced as: new chemical product. Availability: laboratory quantities. Stauffer Chemical Co., Agricultural Chemical Div.

## ESTANE (polyurethane thermoplastic elastomer)

Sp.G., 1.20. Solubility: types soluble in THF or MEK. Chemical properties: high tensile strength and ultimate elongation without curing; extraordinary abrasion resistance; excellent low-temperature flexibility; resistance to paraffinic hydrocarbons. Suggested uses: shoe heels; shoe finishes; automotive scuff pads; automobile door welting; athletic ball covers; textile coatings; coatings for flooring, construction, aircraft wing linings; packaging films, mechanical goods. Introduced as: new chemical product. Availability: semicommercial quantities. B. F. Goodrich Chemical Co.

## ETHOQUADS® C/12, C/25, O/12, O/25, 18/12 AND 18/25

[RN(CH<sub>2</sub>CH<sub>2</sub>O)<sub>x</sub>H(CH<sub>2</sub>CH<sub>2</sub>O)<sub>y</sub>HCH<sub>3</sub>]<sub>n</sub> Cl; M.W., C/12, 353; C/25, 925; O/12, 416; O/25, 988; 18/12, 422; 18/25, 994. Sp.G., C/12, 0.969; C/25, 1.071; O/12, 0.932; O/25, 1.062; 18/12, 0.919; 18/25, 1.058. Activity: C/12, O/12, 18/12, 75% in isopropanol; C/25, O/25, 18/25, 100%. Solubility: up to 35% in water; complete in lower alcohols, ketones, etc. Chemical properties: solubility and compatibility, especially with anionics; combination of ethylene oxide adduct and quaternary. Suggested uses: antistatic agent, dyeing assistant, electroplating additive, bacteriostat, emulsifier, dispersing agent, surface-active agent. Introduced as: products with new degree of availability. Availability: commercial quantities. Armour Industrial Chemical Co.

## ETHYLAMINE HYDROCHLORIDE

C<sub>2</sub>H<sub>5</sub>NH<sub>2</sub>·HCl; M.W., 126.0; M.P., 106-108°C; Solubility: readily soluble in water; soluble in alcohol; insoluble in ether. Suggested uses: chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. City Chemical Corp.

## "ETHYL" ANTIKNOCK COMPOUND-TEL-MOTOR 33 MIX

Constituents: % By Wt.: tetraethyl lead, 57.52; methyl cyclo pentadienyl-manganese tricarbonyl, 6.97; ethylene dibromide, 16.71; ethylene dichloride, 17.60; dye, kerosene, etc., 1.20. Sp.G., 1.581; Purity: above 99.12%. Solubility: completely soluble in gasoline at normal-use concentrations. Chemical properties: formulation utilizes the "promoter" effect of patented manganese compound to improve antiknock response of tetraethyl lead. Suggested uses: as a gasoline antiknock, it makes possible higher antiknock quality than present compounds at the same concentrations. Introduced as: new chemical product. Availability: commercial quantities. Ethyl Corp.

## "ETHYL" ANTIOXIDANT 712 (4,4'-bis(2,6-di-tert-butylphenol)

M.W., 410.6; Density, 1.029 gms./ml. at 20°C; M.P., 186°C; B.P., 280°C; Flash Pt., 210°C. Solubility: insoluble in water; insoluble in 10% NaOH; soluble in isopentane, 41.6 wt. % at

20 C. Chemical properties: light yellow crystal-line solid; low volatility; temperature stable. Suggested uses: to inhibit oxidation in natural and synthetic rubbers, plastic materials such as polyethylene and polypropylene, petroleum oil, and waxes. Introduced as: new chemical product. Availability: semicommercial quantities. Ethyl Corp.

#### ETHYL BENZYL CHLORIDES (MIXED ISOMERS)

##### (1-chloromethyl ethyl benzene)

$\text{ClCH}_2\text{C}_6\text{H}_4\text{C}_2\text{H}_5$ ; Constituents: consists of 70% para and 30% ortho ethyl benzene. M.W., 134.64; Sp.G., 1.0460-1.0475 at 25/25 C; R.I.,  $n_D^{20}$ , 1.5290-1.5305. Purity: 99%; Solubility: soluble in alcohols, ethers, ketones, chlorinated hydrocarbons; insoluble in water. Chemical properties: hydrolysis to alcohol, reduction to ethyl methyl benzenes, mild oxidation to aldehydes, strong oxidation to acids; should form interesting polymers in presence of  $\text{AlCl}_3$ ,  $\text{BCl}_3$ ,  $\text{FeCl}_3$ , etc. Suggested uses: useful intermediate for pharmaceutical, dye, perfume, leather, lubricant, rubber, protective coating, resin, metal and textile industries. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### ETHYL w-BROMO-UNDECANOATE (ethyl 11-bromoundecanoate)

$\text{C}_{13}\text{H}_{25}\text{O}_2\text{Br}$ . M.W., 293; M.P., 188-190 C at 18 mm.; Solubility: insoluble in water; soluble in alcohol, ether. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: laboratory quantities. City Chemical Corp.

#### ETHYL DPA

##### (ethyl 4,4-bis(4-hydroxyphenyl)pentanoate)

$\text{CH}_3\text{C}(\text{HO C}_6\text{H}_4)_2\text{CH}_2\text{CH}_2\text{COO C}_2\text{H}_5$ ; M.W., 314 theoretical; M.P., 128.5-130 C; Saponification Eq., 301.6. Solubility: soluble in nitromethane, ethanol, ethyl acetate, ethyl ether, methyl ethyl ketone; insoluble in hydrocarbon solvents. Chemical properties: appearance—light tan crystals. Suggested uses: chemical and resin intermediate where blocked carboxyl group is desired. Introduced as: new chemical product. Availability: laboratory quantities. S. C. Johnson & Son, Inc., Service Products Div.

#### ETHYLENEDIAMINE TETRAACETIC ACID, DISODIUM CADMIUM SALT

$\text{C}_{10}\text{H}_{12}\text{N}_2\text{O}_8\text{Na}_2\text{Cd}$ . M.W., 446.4; Solubility: readily soluble in water. Introduced as: new chemical product. Availability: semicommercial quantities. City Chemical Corp.

#### 2-ETHYLHEXYL CROTONATE

$\text{C}_{12}\text{H}_{22}\text{O}_2$ ; M.W., 198.3; Sp.G., 0.88 at 20/20 C; B.P., 204 C at 760 mm.; Flash Pt. (Tag Open Cup), 245 F; R.I. ( $n_D^{20}$ ), 1.4438. Purity: 99+%; Solubility: miscible with acetone, benzene, ethanol, and carbon tetrachloride; insoluble in water. Chemical properties: may be dimerized with subsequent hydrogenation to form bis(2-ethylhexyl)-2-ethyl-3-methyl glutarate, which has been evaluated as a plasticizer. Suggested uses: constituent of perfumes and as an insect repellent for use on plastics and paints. Introduced as: new chemical product. Availability: laboratory quantities, commercial quantities. Eastman Chemical Products, Inc., Chemicals Div.

#### ETHYLIDENE DICHLORIDE

$\text{C}_2\text{H}_4\text{Cl}_2$ ; M.W., 99.0; Sp.G., 1.170-1.172; B.P., 56.5-57.3 C; Acidit. as  $\text{HCl}$ , max. 0.01%; Non-volatile matter, max. 0.01%; Color APHA, max. 15. Solubility: at 25 C, infinite solubility in acetone, benzene, carbon tetrachloride, ether, methanol; very slightly soluble in water. Suggested uses: extraction solvent; chemical intermediate. Introduced as: product with new degree of availability. Availability: commercial quantities. The Dow Chemical Co., Technical Service and Development Div.

#### "ETHYL" IGNITION CONTROL COMPOUND 3

Constituents: mixed methyl phenyl phosphates: dimethyl phenyl phosphate 45%, triphenyl phosphate 40%, methyl diphenyl phosphate 15%; Sp.G., 1.168 at 68 F; Flash Pt., >109 F; Pour Pt., <-94 F; Wt., 9.73 lb./gal at 68 F; Solubility: in gasoline at 32 F, 18.5 vol. %; in gasoline at 65 F, miscible; in water at 86 F, <10 ppm. Chemical properties: phosphorus content (diluted with toluene) wt. %, 11. Suggested uses: in motor gasoline—to minimize spark-plug fouling, surface ignition, and rumble. Introduced as: new chemical product. Availability: commercial quantities. Ethyl Corp.

#### ETHYL ISOCYANATE (ENCO)

$\text{C}_3\text{H}_7\text{NCO}$ ; M.W., 71.08; Sp.G., 0.898; B.P., 60 C; Purity: 90% min.; Solubility: soluble in chlorinated and aromatic hydrocarbon; reacts

with water. Suggested uses: pharmaceutical intermediate; organic syntheses. Introduced as: product with new degree of availability. Availability: commercial quantities. The Carwin Co.

#### N-ETHYL PIPERIDINE

$\text{C}_7\text{H}_{13}\text{N}$ ; M.W., 113; Sp.G., 0.824-0.826; B.P., 127-132 C; R.I., 1.444-1.445. Purity: 97.5% min.; Suggested uses: in antibiotics production. Introduced as: new chemical product. Availability: commercial quantities. Aceto Chemical Co., Inc.

#### ETHYLPYRIDYLETHYL ACRYLATE

$\text{CH}_2=\text{CHOCOC}_2\text{H}_4[\text{C}(\text{CH}_3)\text{CH}(\text{C}_2\text{H}_5)\text{CH}(\text{N})]$ ; M.W., 205.3; Sp.G., 1.0458 at 20/20 C; Fr.Pt., sets to a glass below -75 C; B.P., at 50 mm., 181.0 C at 10 mm., 149.0 C at 1 mm., 100.0 C; Vapor Pressure, at 20 C, <0.01 mm. Hg; Solubility: % by wt. in water, at 20 C, 0.35; solubility of water in, at 20 C, 4.2. Chemical properties: undergoes usual reactions of acrylic esters, copolymerizes readily with vinyl acetate, acrylonitrile, vinylidene chloride, styrene, butadiene and other acrylic esters; monomer and its polymers may be quaternized. Suggested uses: comonomer in acrylic fibers to improve dyeability; quarternaries of its polymers and copolymers for ion exchange resins; copolymers with styrene and butadiene for tire cord adhesives, gasketing and other pyridyl rubber applications. Introduced as: new chemical product. Availability: research quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### EVEZIZE (sodium acid pyrophosphate)

$\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$ ; Purity: food grade; Chemical properties: granular particle size to afford controlled reaction rate with  $\text{NaHCO}_3$  to liberate  $\text{CO}_2$  and to minimize segregation when formulated with other granular materials. Suggested uses: self rising flour, cake mixes and refrigerated bakery product mixes. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Div.

#### EXPERIMENTAL ANTIOXIDANT 80

##### (2,6 bis (2'-hydroxy-3'-tert-butyl-5'-methylbenzyl)-4-methyl phenol)

$\text{C}_{31}\text{H}_{40}\text{O}_3$ ; M.W., 460; Purity: 95-98%; Solubility: soluble in acetone, alcohol and aromatic hydrocarbons; limited solubility in aliphatic hydrocarbons. Chemical properties: outstanding antioxidant for plastics, especially polyolefins. Suggested uses: antioxidant for plastics; antioxidant and preservative for paraffin wax and certain fats and oils. Introduced as: new chemical product. Availability: semicommercial quantities. American Cyanamid, Organic Chemicals Div.

#### EXPERIMENTAL EMULSIFIER 9D-207

Constituents: alkyl aryl polyether alcohols and related compounds. Sp.G., 0.98; Purity: 100% active; Solubility: water insoluble; miscible in aromatic solvents; soluble above 3% in agricultural spray oils, hazy up to 2%. Suggested uses: emulsifier for agricultural spray oils. Introduced as: new chemical product. Availability: semicommercial quantities. Rohm & Haas Co., Agricultural & Sanitary Chemicals Div.

#### EXPERIMENTAL EMULSIFIER 9D-208

Constituents: alkyl aryl polyether alcohols and related compounds. Sp.G., 1.02; Purity: 100% active; Solubility: water insoluble; miscible with kerosene and aromatic solvents; insoluble in paraffinic oils. Suggested uses: emulsifier for solvent based emulsion cleaners and other formulations involving emulsified kerosene or aromatic solvents. Introduced as: new chemical product. Availability: semicommercial quantities. Rohm & Haas Co., Agricultural & Sanitary Chemicals Div.

#### EXPERIMENTAL SURFACTANT 9D-212

##### (alkyl aryl polyether)

Sp.G., 1.01; Viscosity, 180 cps. at 77 F; Cloud Pt., 66 F (1%); pH, 7.1 (1%); Fr.Pt., <-4 F; Purity: 100% active (nonionic); Solubility: soluble in all proportions in water, lower alcohols, ketone, chlorinated solvents, aromatic solvents; insoluble in aliphatic solvents. Chemical properties: low foam; outstanding wetting. Suggested uses: low foam surfactant and wetting agent in metal cleaning, dish washing and textile formulations. Introduced as: new chemical product. Availability: semicommercial quantities. Rohm & Haas Co., Agricultural & Sanitary Chemicals Div.

#### EXTRACTANT NO. 5

##### (mono-di-ocetylphenyl acid phosphate)

$\text{C}_{26}\text{H}_{44}\text{C}_2\text{H}_4\text{OP}(\text{O})(\text{OH})_2$  &  $(\text{C}_2\text{H}_5)_2\text{C}_6\text{H}_4\text{O}_2\text{P}(\text{O})(\text{OH})_2$ ; M.W., av. 380; M.P., 35-40 C; B.P., Dec. about 200 C; Solubility: insoluble

in water; readily soluble in common organic solvents. Chemical properties: good extractant of metallic ions from aqueous solutions; low cost and low stripping loss. Suggested uses: metal extractant. Introduced as: new chemical product. Availability: semicommercial quantities. Victor Chemical Works, Div. Stauffer Chemical Co.

#### FERRIC ACETYLACETONATE

$\text{Fe}(\text{C}_5\text{H}_7\text{O}_2)_3$ . M.W., 353.17; M.P., 182 C; Purity: >99.9%; Solubility: slightly soluble in water; moderately soluble in benzene. Chemical properties: red crystalline powder; organic-soluble. Suggested uses: combustion catalyst, polymerization catalyst, pigment, resin and polymer stabilizer, drier, intermediate for organic compound synthesis, soot remover, and others. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

#### FERROCENE (dicyclopentadienyliron)

$(\text{C}_5\text{H}_5)_2\text{Fe}$ ; M.W., 186.03; M.P., 173-174 C; Purity: 98%; Solubility: readily soluble in common organic solvents such as benzene, ether, and ethanol; soluble in water, alkaline, and acid solutions. Chemical properties: has the stability and undergoes many of the reactions characteristic of aromatic compounds. Suggested uses: possible antiknock additive for fuels in spark ignition engines; intermediates. Introduced as: significantly new grade. Availability: laboratory quantities. The Matheson Co., Inc., Matheson Coleman & Bell Div.

#### FLEXBOND EXP. 1025-37-1A

##### (vinyl acetate/vinyl stearate copolymer emulsion)

Solids, 48%; Color, milk white; Viscosity, 100-200 cps.; Wt./Gal., 9.0 lbs. Solubility: infinitely dilutable with water. Chemical properties: grease resistant, water resistant, highly flexible film former. Suggested uses: in the manufacture of grease-resistant paper and paper-board products; related types used in leather finishes, textile coatings. Introduced as: significantly new grade. Availability: commercial quantities. Colton Chemical Co., Div. Air Reduction Co., Inc.

#### FLEXBOND EXP. E-3

##### (polyvinyl acetate copolymer emulsion)

Solids, 48%; Color, milk white; Viscosity, Particle Size, 0.25 micron; pH, 4-5. Solubility: properties: capable of undergoing cross linkage to obtain a high degree of insolubilization. Suggested uses: as an emulsion vehicle in industrial primers. Introduced as: significantly new grade. Availability: semicommercial quantities. Colton Chemical Co., Div. Air Reduction Co., Inc.

#### FLEXOL® PLASTICIZER EP-8

##### (2-ethylhexyl epoxy tallate)

M.W., approx. 416; Sp.G., 0.9221 at 20/20 C; B.P., >215 C (5 mm.); Viscosity at 20 C, 33.5 cps. Solubility: soluble at 25 C in acetone, carbon tetrachloride, benzene, methanol, hexane, and ethyl ether. Chemical properties: exceptionally high oxirane oxygen content and low iodine value with improved stabilizing action and compatibility for vinyl chloride resins; low plastisol viscosity and excellent plastisol viscosity stability. Suggested uses: low-temperature plasticizer and epoxy stabilizer for vinyl chloride resins. Introduced as: new chemical product. Availability: semicommercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### FLEXOL® PLASTICIZER EPO

##### (epoxidized soybean oil)

Sp.G., 0.956 at 20/20 C; B.P., >150 C, (5 mm.); Viscosity, at 100 F, 188 cps. Solubility: soluble at 25 C in acetone, carbon tetrachloride, benzene, heptane and ethyl ether; solubility in methanol, 1.7% by wt. at 25 F. Chemical properties: a clear, light-colored liquid; exceptionally high oxirane oxygen content and low residual unsaturation with maximum stabilizing action and compatibility for vinyl chloride resins. Suggested uses: as an improved epoxy stabilizer with plasticizing action for the prevention of heat and light degradation of vinyl chloride resins. Introduced as: new chemical product. Availability: commercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### FOLROSIA

Sp.G., 25/25, 0.914-0.919; Hydroxyl Value, 383 min.; R.I., 1.4640-1.4665. Chemical properties: an aromatic alcohol in the rose family of odors. Suggested uses: "broad spectrum" aromatic having a rose leaf odor for imparting naturalness to perfume compositions. Introduced as: new chemical product. Availability: semicommercial quantities. Givaudan-Delawanna, Inc.



# 437 NEW CHEMICALS

## FOR INDUSTRY

### FORTIFIED POWER-PAK

Constituents: cleansing agents plus lanolin and an antioxidant. Chemical properties: increased sweet stain removal; elimination of streaks and swirls. Suggested uses: dry cleaning detergent. Introduced as: significantly new grade. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Div.

### FORTIFLEX A-70-12, A-250-12 AND A-500-12

Sp.G., 1.04; Melt Indices: from 0.7 dg./min. to 5.0 dg./min. Chemical properties: flame resistant high density polyethylene; classified as non-burning according to ASTM test procedure D635-56T. Suggested uses: electrical appliances. Introduced as: new chemical product. Availability: commercial quantities. Celanese Plastics Co.

### FREEZIST (processed starch)

Constituents: modified tapioca. Purity: meets NCA specifications. Solubility: dispersible in 180 F aqueous solutions. Chemical properties: food thickener and stabilizer with built-in freeze-thaw stability; stable to acid and hot aqueous solutions. Exceptional organoleptic features. Suggested uses: thickening agent for frozen food products. Introduced as: significantly new grade. Availability: commercial quantities. Morningstar-Paisley, Inc., Food Products Div.

### FRUITFIL (processed starch)

Constituents: modified tapioca. Purity: meets NCA specifications; Solubility: dispersible in 180 F aqueous solutions. Chemical properties: food thickener and stabilizer with exceptional organoleptic features; stable to heat and acid solutions. Suggested uses: thickening agent for all food products. Introduced as: significantly new grade. Availability: commercial quantities. Morningstar-Paisley, Inc., Food Products Div.

### GB-1 RESIN

Constituents: resinous product from bis-phenol, epichlorohydrin and chloroacetic acid. M.P., 80-90 C; Acid Number, 95. Solubility: completely soluble in dilute alkalis and ethanol. Chemical properties: forms hard, resistant films. Suggested uses: shellac replacement, film former component from water or alcohols, printing ink resin, floor finishes, etc. Introduced as: new chemical product. Availability: commercial quantities. S. C. Johnson & Son, Inc., Service Products Div.

### GEIGY ATRAZINE

(2, chloro-4, ethylamino-6, isopropylamino-s-triazine)

C<sub>8</sub>H<sub>14</sub>N<sub>6</sub>Cl; Available as 50 and 80% wettable powder and as 8% granular. Solubility: 70 ppm. in water. Chemical properties: low toxicity, noninflammable, noncorrosive to metals. Suggested uses: pre-emergence herbicide in corn; herbicide for industrial weed control. Introduced as: new chemical product. Availability: commercial quantities. Geigy Chemical Corp., Agricultural Chemicals Div.

### GRAPHIC RED M CP-562 (strontium lithol)

Sp.G., 1.61; Purity: commercial. Chemical properties: a non-resinated, medium shade red pigment that may be used alone or mixed with sodium lithols for lighter or yellower shades and with calcium lithols for darker or bluer shades. Suggested uses: used for toy enamels where specifications do not permit use of barium compounds. Introduced as: new chemical product. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

### DL-GLUTAMINE

C<sub>5</sub>H<sub>10</sub>N<sub>2</sub>O<sub>3</sub>; M.P., 176 C; Purity: 98%. Introduced as: product with new degree of availability. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

### GRAPHIC RED R CP-1395 (calcium lithol)

Sp.G., 1.50; Purity: commercial; Solubility: very good resistance to bleed in water. Chemical properties: a non-resinated calcium lithol with exceptionally low water bleed compared with regular calcium lithols; as strong as and considerably brighter and yellower than other

pigments of this type. Suggested uses: in letterpress, heat set, rotogravure and lithographic inks. Introduced as: new chemical product. Availability: commercial quantities. The Sherwin-Williams Co., Pigment Color & Chemical Div.

### HEPTANE

CH<sub>3</sub>(CH<sub>2</sub>)<sub>5</sub>CH<sub>3</sub>; M.W., 100.21; Sp.G., D 20/4, 0.68376; B.P., 98-99 C; U.V. Cut-Off, 210 mμ. Purity: 99%; Solubility: miscible with most organic solvents. Chemical properties: extremely good solvent for both U.V. and infra-red spectroscopy. Suggested uses: for use as spectroquality solvent. Introduced as: significantly new grade. Availability: semicommercial quantities. The Matheson Co., Inc., Matheson Coleman & Bell Div.

### HEXACHLORO-2-CYCLOPENTENONE

C<sub>6</sub>Cl<sub>6</sub>O; M.W., 288.74; M.P., 28 C; B.P., 51 C at 0.03 mm. Purity: greater than 95%. Solubility: soluble in hexane and heptane. Chemical properties: reacts with aqueous sodium hydroxide to form sodium pentachloropentadienoate and with alcohols to give esters of pentachloropentadienoic acid. Suggested uses: chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Hooker Chemical Corp., Product Development Div.

### n-HEXYL BROMIDE (1-bromohexane)

CH<sub>3</sub>(CH<sub>2</sub>)<sub>5</sub>Br; M.W., 165.086; Sp.G., 1.1696 at 25/25 C; B.P., 153-161 C; Purity: 98%; Solubility: insoluble in water; soluble in alcohols, esters, ethers. Chemical properties: colorless to slightly yellow liquid used for introduction of n-hexyl group into compounds. Suggested uses: manufacture of pharmaceuticals, perfumes, flavors and other type organic compounds. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

### N-HEXYL PYRROLIDINE

M.W., 155.27; B.P., 201 C; R.I., n<sub>D</sub><sup>20</sup>, 1.4444; Fr.Pt., <-75 C; Flash Pt., 154 F. Solubility: in water, 0.59% by wt. Chemical properties: toxicity unknown, recommend caution. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansul Chemical, Market R & D.

### HIGH-MELTING SYNTHETIC WAX SERIES: 267, 272, 315, 325, 335, 350, 350-A and 400

Chemical properties: names represent approx. F melting points; 267 and 272 do not warp or shrink on cooling; 335 does not shrink upon cooling; 350-A is translucent and in sheets exhibits plastic tendencies permitting slight deformation before breaking; all have limited solubilities. Suggested uses: to modify melting points of wax-resin blends, asphalt, tars and similar compounds; provide chemically resistant coatings. Introduced as: new chemical products. Availability: commercial quantities. Carlisle Chemical Works.

### HIGH-PURITY INDENE

C<sub>9</sub>H<sub>8</sub>; M.W., 116.15; Sp.G., at 25/4 C, 0.9927; M.P., -3.5 C; B.P., 180-6 C; Purity: 97.5% by wt.; Solubility: miscible with a large number of solvents. Chemical properties: benzene-fused five-membered ring with an active methylene group and double bond. Suggested uses: chemical intermediate and monomer. Introduced as: significantly new grade. Availability: semicommercial quantities. Neville Chemical Co.

### HIGH-PURITY SILICON

Si; Supplied as optical blanks. Sp.G., 2.329 at 25 C; M.P., 1420 C; Purity: impurities expressed in parts per billion, specifications set by negotiations with purchasers. Chemical properties: excellent light-gathering power, good resolution, good-to-excellent transmittance in infrared band; high index of refraction. Suggested uses: optical blanks may be ground and polished to form lenses, optical windows and hollow domes for use in infrared surveillance and detection devices. Introduced as: significantly new grade. Availability: semicommercial quantities. Dow Corning Corp., Hyper-Pure Silicon Div.

### HOMOVERATRIC ACID

(3,4-dimethoxyphenylacetic acid)

C<sub>10</sub>H<sub>12</sub>O<sub>4</sub>; M.W., 196.21; M.P., 94-101 C; Purity: 92% min.; Solubility: very slightly soluble in water; soluble in most organic solvents. Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

### HOMOVERATRYLAMINE

(3,4-dimethoxyphenethylamine)

Sp.G., 1.09 at 25/25 C; B.P., 295 C; R.I., 1.5442-1.5452 at 25 C; Purity: 95% min.;

Solubility: soluble in water, alcohol, acetone and benzene. Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

### "HUBER" KAOLINS

(aluminum silicates)

Al<sub>2</sub>O<sub>3</sub>·2SiO<sub>2</sub>·2H<sub>2</sub>O; Sp.G., 2.60; Chemical properties: complete line of dry refined, washed and calcined kaolinites (pine). Suggested uses: fillers for paint, ink, plastics, adhesives. Introduced as: product with new degree of availability. Availability: commercial quantities. J. M. Huber Corp., Industrial Products Dept.

### HYDROGENATED BISPHENOL A

(2,2-bis (4-hydroxy cyclohexyl) propane)

C<sub>15</sub>H<sub>26</sub>O<sub>2</sub>; M.W., 240.35; M.P., 150.0 C. Chemical properties: cyclic glycol. Suggested uses: chemical-resistant raw material for unsaturated polyesters for laminating and surface-coating applications. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Div.

### HYDROQUINONE DI(β-HYDROXYETHYL) ETHER

C<sub>12</sub>H<sub>14</sub>O<sub>4</sub>; M.W., 198.2; M.P., 94-96 C; B.P., 185-200 C at 0.3 mm.; Solubility: slightly soluble in acetone and ethanol; insoluble in cold water; soluble in hot water. Chemical properties: has a stable ether linkage, reactive ring hydrogens, and two available hydroxy groups. Suggested uses: raw material in organic syntheses and as a reactant in the preparation of polyesters, polyurethanes and polyolefins. Introduced as: new chemical product. Availability: laboratory quantities. Eastman Chemical Products, Inc., Chemicals Div.

### N-HYDROXY ETHYL PYRROLIDINE

N-CH<sub>2</sub>CH<sub>2</sub>OH; M.W., 115.18; B.P., 187 C; Fr.Pt., <-75 C; Flash Pt., 160 F; R.I., n<sub>D</sub><sup>20</sup>, 1.4722. Chemical properties: colorless liquid; toxicity unknown, recommend caution. Introduced as: product with new degree of availability. Availability: laboratory quantities. Ansul Chemical, Market R & D.

### IMIDAZOLES

C<sub>3</sub>H<sub>4</sub>N<sub>2</sub>; Solubility: soluble in water and organic solvents. Chemical properties: stability; resistance to oxidation and reduction; can be sulfonated, halogenated, nitrated. Suggested uses: intermediates for preparation of pharmaceuticals, metal complexes, dyestuffs, surfactants, fungicides. Introduced as: significantly new type (substituted in 2-position). Availability: laboratory quantities. Houdry Process Corp., Sales & Services Div.

### IMPREGNOLE FH

Constituents: synthetic wax composition dispersed with complex polyvalent metal salt. Sp.G., 1.0; pH, 4.0. Purity: 30% active matter; Solubility: dispersible in cold water. Chemical properties: one-component aqueous wax, metal base, water repellent; outstanding compatibility with textile finishing resins. Suggested uses: to produce water repellency on all types of fabrics; especially effective when used in conjunction with thermosetting or thermoplastic resin builders. Introduced as: new chemical product. Availability: commercial quantities. Warwick Chemical Co., Div. Sun Chemical Corp.

### ISOBUTYLENE

(isobutene)

C<sub>4</sub>H<sub>8</sub>; M.W., 56; Sp.G., 0.721 at 60 F; M.P., -140 C; B.P., -7.22 C; Purity: 99.4% min.; Solubility: soluble in organic solvents. Suggested uses: alkylation reactions, polymers and copolymers. Introduced as: product with new degree of availability. Availability: commercial quantities. Petro-Tex Chemical Corp.

### ISOCETYL LAURATE

C<sub>11</sub>H<sub>23</sub>COOC(C<sub>16</sub>H<sub>33</sub>); M.W., 424.5; Sp.G., 0.858; Fr.Pt., <-65 C; Color, 100 A.P.H.A. (max.); Iodine Value, 0.66; Viscosity at 25 C, 19.6 cp. Solubility: insoluble in water; soluble in most organic solvents. Chemical properties: fatty portion is typical of commercial lauric acid; high molecular weight and high degree of saturation, coupled with low freezing point and low viscosity; practically no odor; oily liquid. Suggested uses: emollient, lubricant, fixative and solvent in cosmetic and pharmaceutical preparations; lubricant-plasticizer in resin compositions; mold release agent; textile softener and lubricant; metal processing lubricant. Introduced as: new chemical product. Availability: commercial quantities. Kessler Chemical Co., Inc.

### ISOCETYL MYRISTATE

$C_{13}H_{27}COOC_{14}H_{29}$ ; M.W., 452.5; Sp.G., 0.857; Fr.Pt., -39°C; Color, 100 A.P.H.A. (max.); Iodine Value, 0.97; Viscosity at 25°C, 25.6 cp. Solubility: insoluble in water; soluble in most organic solvents. Chemical properties: fatty portion is typical of commercial myristic acid; high molecular weight and high degree of saturation, coupled with low freezing point and low viscosity; practically no odor; oily liquid. Suggested uses: emollient, lubricant, fixative and solvent in cosmetic and pharmaceutical preparations; lubricant-plasticizer in resin compositions; mold release agent; textile softener and lubricant; metal processing lubricant. Introduced as: new chemical product. Availability: commercial quantities. Kessler Chemical Co., Inc.

### ISOCETYL OLEATE

$C_{17}H_{33}COOC_{18}H_{33}$ ; M.W., 506.6; Sp.G., 0.862; Fr.Pt., -17°C (gcd); Color, 150 A.P.H.A. (max.); Viscosity at 25°C, 29.0 cp. Solubility: insoluble in water; soluble in most organic solvents. Chemical properties: fatty portion is typical of commercial oleic acid; high molecular weight coupled with low freezing point and low viscosity; mild, characteristic odor; oily liquid. Suggested uses: emollient, lubricant, fixative and solvent in cosmetic and pharmaceutical preparations; lubricant-plasticizer in resin compositions; mold release agent; textile softener and lubricant; metal processing lubricant. Introduced as: new chemical product. Availability: commercial quantities. Kessler Chemical Co., Inc.

### ISOCETYL STEARATE

$C_{17}H_{35}COOC_{18}H_{37}$ ; M.W., 508.6; Sp.G., 0.857; Fr.Pt., 0°C; Color, 100 A.P.H.A. (max.); Iodine Value, 1.0 (max.); Viscosity at 25°C, 32 cp. Solubility: insoluble in water; soluble in most organic solvents. Chemical properties: fatty portion is typical of commercial stearic acid; high molecular weight and high degree of saturation, coupled with low freezing point and low viscosity; oily liquid; mild odor. Suggested uses: emollient, lubricant, fixative and solvent in cosmetic and pharmaceutical preparations; lubricant-plasticizer in resin compositions; mold release agent; textile softener and lubricant; metal processing lubricant. Introduced as: new chemical product. Availability: commercial quantities. Kessler Chemical Co., Inc.

### ISOCINCHOMERONIC ACID (pyridine 2,5 dicarboxylic acid)

M.W., 167.12; M.P., approx. 236°C (decomp.); Purity: 95%; Solubility: in ethanol, 0.36; in water, 0.21; in benzene, 0.08; in ether, 0.08. Chemical properties: ring nitrogen offers possible increased dye receptivity in polymer applications. Suggested uses: intermediate for pharmaceuticals, insecticides, polymers and dyes. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansul Chemical, Market R & D.

### LAKE RED C CP-1390

Sp.G., 1.66; Purity: commercial; Solubility: very good resistance to water bleed. Chemical properties: very clean yellow shade, non-resinated Lake Red C with exceptional strength and outstanding fountain stability. Suggested uses: used primarily in offset printing inks, but may also be used as a good general purpose color for letterpress, gravure, flexographic, moisture set and heat set inks. Introduced as: new chemical product. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

### LANTHANUM MAGNESIUM NITRATE

$2La(NO_3)_3 \cdot 3Mg(NO_3)_2 \cdot 24H_2O$ ; M.W., 1527; Solubility: very soluble in water. Introduced as: new chemical product. Availability: laboratory quantities. City Chemical Corp.

### LEAD TUNGSTATE (lead wolframite)

$PbWO_4$ ; M.W., 455; Solubility: insoluble in water; decomposed by mineral acids; soluble in alkalis. Introduced as: product with new degree of availability. Availability: semicommercial quantities. City Chemical Corp.

### LEMOFLEX

(polyvinyl alcohol derivative)

Saponification No., 20 max., pH, 6.7 (4% solution); Viscosity, 360-390 cp. (10% solution); Tensile Strength, 2600-2800 lbs./sq. in.; Heat Seal Temperature, 350°F at 10 psi. Solubility: soluble in water, insoluble in most organic solvents. Chemical properties: cream-yellow powder; similar to polyvinyl alcohol in structure, but modified to make the resin permanently flexible; stable in both high and low relative humidity ranges. Suggested uses: heat-

sealable film for water-soluble packages for detergents, bleaches, dyestuffs, etc.; barrier coating for oxygen, nitrogen and carbon dioxide; oil- and grease-resistant coating for paper and paperboard. Introduced as: new chemical product. Availability: commercial quantities. Borden Chemical Co.

### LIGHT DENSITY, SODIUM TRIPOLYPHOSPHATE

$Na_5P_3O_{10}$ ; M.W., 366;  $P_2O_5$ , 57.4; total  $Na_2O$ , 41.8. Purity: industrial grade; Solubility: 13 parts by weight per 100 parts water. Chemical properties: porous granular product that dissolves more rapidly in water, soaks up liquid surfactants used in formulating dry detergents, and adds bulk to formulated products. Suggested uses: as a raw material in liquid and dry detergent formulations. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Div.

### LOW TURBIDITY TETRA POTASSIUM PYROPHOSPHATE

$K_4P_2O_7$ ; M.W., 330;  $P_2O_5$ , 42.5; total  $K_2O$ , 56.99. Solubility: 65 parts by weight per 100 parts aqueous solution. Chemical properties: high solubility, low turbidity. Suggested uses: as a builder for liquid detergents. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Div.

### LUPEROX 2.5-2.5

(2,5-dimethylhexane-2,5-dihydroperoxide)

$C_8H_{18}O_4$ ; M.W., 178.2; M.P., 102-104°C; Purity: 90% (min.); Solubility: slightly soluble in water; soluble in common organic solvents. Chemical properties: a stable, relatively pure, nonvolatile, solid crystalline alkyl dihydroperoxide; decomposes at moderate to high temperatures to provide a source of free radicals; its high active oxygen content and ability to dissociate into free radicals make it a valuable polymerization initiator for curing unsaturated polyester resins; organopolysiloxane compositions have been successfully prepared. Suggested uses: as a nonvolatile, high-temperature polymerization catalyst. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Lucidol Div., Wallace & Tiernan Inc.

### LUPEROX #6

M.P., 66-68°C; Purity: 90% (min.); Solubility: slightly soluble in water; soluble in common organic solvents. Chemical properties: a solid crystalline ketone peroxide available as a fine white powder; active oxygen = 6.25%, min.; exotherm measurements (S.P.I. procedure) at 180°F (using typical unsaturated polyester resins) show a fast gel time with a long cure time; with certain resins, a lower peak exotherm temperature is obtained than that obtained with other ketone peroxides—should prove advantageous in applications involving molding, casting or potting where crazing is to be avoided. Suggested uses: as an effective catalyst for the room- or low-temperature polymerization of polyester resins; when used in conjunction with metallic promoters, faster gel times are obtained than with other commercially available ketone peroxides. Introduced as: product with new degree of availability. Availability: commercial quantities. Lucidol Div., Wallace & Tiernan Inc.

### LUPERSOL #101

(2,5-dimethyl-2,5-di-*t*-butylperoxyhexane)

$C_{14}H_{34}O_4$ ; M.W., 290.4; Sp.G., 0.869; B.P., 62.5°C at 0.05 mm.; Purity: 90% min. assay; Solubility: insoluble in water; soluble in common organic solvents. Chemical properties: a stable, relatively pure, nonvolatile, difunctional peroxy compound; decomposes at moderate to high temperatures to provide a source of free radicals; for crosslinking polyethylene, this compound remains stable at processing temperatures, then decomposes at curing temperatures; best crosslinking results can be obtained by using 2-3% peroxide based on resin weight; for curing silicone rubbers, 0.3-1.5% peroxide concentrations are suggested (for polyester premix and diallyl phthalate molding compounds, this peroxide should extend the catalyzed shelf life and permit molding at higher temperatures). Suggested uses: laboratory work suggests that it is applicable for crosslinking olefins and other polymers having an abstractable hydrogen structure as well as for polymerizing vinyl type polymers. Introduced as: new chemical product. Availability: laboratory quantities. Lucidol Div., Wallace & Tiernan Inc.

### LUSTRASOL 4290-50

Constituents: 50% acrylic copolymer in xylol-butanol, Sp.G., 0.985 (solution), 8.17 lbs./gal.; Color, 5 max.; Acid No., 10 max.; Viscosity

(Gardner-Holdt), P-T. Chemical properties: a baking acrylic copolymer with unique conversion characteristics; it cures hard with excellent gloss in 1/2 hour at 250°F; retains gloss and color even when overbaked; yields one-coat metal finishes with excellent chemical resistance and good durability. Suggested uses: as an enamel vehicle for quality top coats on appliances, cabinets, and metal furniture—including laboratory, office, hotel, hospital, etc. Introduced as: new chemical product. Availability: commercial quantities. Reichhold Chemicals, Inc.

### LX-1000

(hydrocarbon resin)

Constituents: hydrocarbon polymer. M.W., 850; Sp.G., 1.073 at 25°C; M.P., 95-100°C; Gardner Color, 10-12 (50% solution in toluene). Solubility: readily soluble in mineral spirits, aromatic solvents; compatible with some alkyds. Chemical properties: imparts the following superior properties in oleoresinous varnishes: fast, hard dry; excellent water and alkali resistance; superior leaching; resin is easily emulsifiable. Suggested uses: alkyd based coatings, aluminum paints, industrial coatings, emulsions and impregnants. Introduced as: significantly new grade. Availability: commercial quantities. Neville Chemical Co.

### LYTRON 822

(surface coating polyelectrolyte resin)

Chemical properties: a carboxyl-containing styrene copolymer that is soluble in either alkaline or organic systems and is compatible with a wide range of natural and synthetic resins; it forms a protective colloid, is a good dispersing agent, pigment binder and emulsifier; a free-flowing polyelectrolyte; its low molecular weight permits low viscosity solutions, previously impossible with compounds of this type. Suggested uses: as the alkali-soluble component in self-polishing resin emulsion and wax emulsion floor dressings. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co.

### MAGNESIUM HYDRIDE

$MgH_2$ ; M.W., 26.336; Sp.G., 1.45; Purity: 92% min.  $MgH_2$ ; Solubility: insoluble or decomposes in all organic solvents tested to date. Chemical properties: contains more hydrogen per unit of volume than liquid hydrogen; hydrogen can be released either by hydrolysis or thermal decomposition, leaving highly active magnesium powder. Suggested uses: reducing agent; blowing agent; rocket fuel; hydrogen source. Introduced as: new chemical product. Availability: semicommercial quantities. The Dow Chemical Co., Technical Service and Development Div.

### MANGANESE ACETYLACETONATE (manganic acetylacetonate)

$Mn(C_5H_7O_2)_3$ ; M.W., 352.24; M.P., 172°C; B.P., decomposes before boiling; Solubility: insoluble in water; soluble in organics (g./100 g., 30°C): benzene, 34.84; n-heptane, 0.10. Chemical properties: dark brown crystalline solid with monoclinic structure; stable in air; organic soluble, good means of introducing metal into organics. Suggested uses: metal plating and uses of ferric acetylacetonate, q.v. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

### MANGANESE DICHLORIDE

$MnCl_2$ ; Formula Wt., 125.85; M.P., 650°C; Sp.G., 2.977; B.P., 1190°C; Purity: >99%; Solubility: soluble in alcohol. Chemical properties: rose-colored, deliquescent cubic crystals; dissolves and hydrates in water. Suggested uses: catalyst; raw material for metal soap production; intermediate for synthesis of new metal chemicals; paint dryer. Introduced as: new chemical product. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

### MANGANESE PYROPHOSPHATE (manganous pyrophosphate)

$Mn_2P_2O_7$ ; M.W., 283.90; Solubility: insoluble in water; soluble in excess alkali pyrophosphates and in acids. Introduced as: product with new degree of availability. Availability: semicommercial quantities. City Chemical Corp.

### MARCO POLYESTER RESIN MX-455 (styrenated polyester resin)

Gel data at 77°F with 0.5% methyl ethyl ketone peroxide (60% solution): Gel Time, 25 minutes; Peak Exotherm, 280°F; Gel to Peak Exotherm, 15 minutes. Chemical properties: superior wet-out of glass reinforcement; low peak exotherm, which lengthens mold life;

# 437

## NEW CHEMICALS

### FOR INDUSTRY

requires 12-15% less resin per unit than conventional polyester hand lay-up resins; no drainage on article surfaces. Suggested uses: hand lay-up of glass-reinforced boats. Introduced as: significantly new grade. Availability: commercial quantities. Celanese Plastics Co.

#### METASAP VA-6

Chemical properties: dry powder, nonlubricating stabilizer. Suggested uses: stabilizer for asbestos-containing polyvinyl chloride stocks. Introduced as: significantly new grade. Availability: semicommercial quantities. Metasap Chemical Co.

#### METASAP VA-7

Introduced as: significantly new grade. Availability: semicommercial quantities. Metasap Chemical Co.

#### METHALLYL ALCOHOL

##### (2-methyl-2-propen-1-ol)

$\text{CH}_3=\text{C}(\text{CH}_3)-\text{CH}_2\text{OH}$ ; M.W., 72.10; Sp.G., 0.8515 at 20/4 C; B.P., 110-116 C; Purity: 98% min.; Solubility: soluble in water, alcohols, ethers. Chemical properties: reactive double bond and alcohol group; preparation of esters for polymerization and co-polymerization type compounds; for introduction of methanyl group into compounds. Suggested uses: intermediate for pharmaceutical, insecticide, dye-stuff, perfume, flavor, resin, plastics, rubber and other industries. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### METHYL ACID PHOSPHATE

Constituents: methyl dihydrogen phosphate and dimethyl hydrogen phosphate. Sp.G., 20/4, 1.414; Acid No., 660; R.I., n<sub>D</sub><sup>20</sup>, 1.4123. Solubility: soluble in water, ethanol, acetone; insoluble in benzene, toluene, hexane. Chemical properties: strong organic acid; readily forms salts with alkali and amines; outstandingly low color. Suggested uses: catalyst in curing of urea-formaldehyde resins; possible use as catalyst in nitrocellulose-amine and butyrate lacquers. Introduced as: new chemical product. Availability: semicommercial quantities. Virginia-Carolina Chemical Corp.

#### METHYL ALUMINUM SESQUIBROMIDE

$(\text{CH}_3)_3\text{Al}_2\text{Br}_3$ ; Formula Wt., 338.813; B.P., 166 C at 760 mm. Hg; Vapor Pressure, mm. Hg, 15 at 60 C; Density at 25 C, 1.514 gm./ml. Chemical properties: cloudy yellow liquid at 25 C; flames instantly with air; reacts violently with water. Suggested uses: catalyst for polymerization of olefins; catalyst for hydrogenation of aromatics; chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ethyl Corp.

#### METHYLAMINODIMETHYLACETAL

(methylaminocetaldehyde dimethyl acetal)  $\text{C}_4\text{H}_{13}\text{NO}_2$ ; Sp.G., 0.924-0.925 at 25/25 C; R.I., 1.406-1.409 at 20 C; Purity: 95% min. Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

#### 2-METHYLBUTENE-2

$\text{C}_4\text{H}_{10}$ ; M.W., 70.13; Sp.G., 20/4, 0.6624; B.P., 38.5 C; Purity: 90%. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. Phillips Petroleum Co., Special Products Div.

#### METHYL CYANOPROPIONATE

##### (methyl 3-cyanopropionate)

$\text{C}_4\text{H}_7\text{O}_2\text{N}$ ; M.W., 113.11; B.P., 100 C at 11 mm.; 275 C; Sp.G., 1.230-1.234 at 25/25 C. Chemical properties: stable liquid

#### METHYL DIPHENYL PHOSPHATE

$\text{C}_{15}\text{H}_{15}\text{O}_4\text{P}$ ; M.W., 264; Sp.G., 1.230-1.234 at 25/25 C. Chemical properties: stable liquid

ester. Suggested uses: plasticizer, gasoline additive, solvent. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

#### METHYL DPA

##### (methyl 4,4-bis(4-hydroxyphenyl)pentanoate)

$\text{CH}_3\text{C}(\text{HO C}_6\text{H}_4)_2\text{CH}_2\text{CH}_2\text{COO CH}_3$ ; M.W., 300 theoretical; M.P., 130.5-132.5 C; Saponification Eq., 286. Solubility: soluble in nitromethane, ethanol, ethyl acetate, ethyl ether, methyl ethyl ketone; insoluble in hydrocarbon solvents. Chemical properties: appearance—light tan crystals. Suggested uses: chemical and resin intermediate where blocked carboxyl group is desired. Introduced as: new chemical product. Availability: laboratory quantities. S. C. Johnson & Son, Inc., Service Products Div.

#### N-METHYLENEGLYCINONITRILE

$\text{C}_3\text{H}_{12}\text{N}_6$ ; M.W., 68.1; M.P., 129 C; Flash Pt., 275 F. Solubility: slightly soluble in common organic solvents. Suggested uses: reactive intermediate. Introduced as: new chemical product. Availability: laboratory quantities. The Dow Chemical Co., Technical Service and Development Div.

#### METHYLENE SULFATE

$\text{C}_2\text{H}_4\text{O}_3\text{S}_2$ ; M.W., 220.2; M.P., 155 C; Purity: 95%+; Solubility: insoluble in water, alcohol, ether, chloroform, benzene; soluble in acetone. Chemical properties: forms methylene ethers with phenols and with alkali cellulose, quaternary salts with tertiary amines; alcohols or glycols yield formals; hydrolyzed by warm water to formaldehyde and sulfuric acid. Suggested uses: chemical intermediate; source of formaldehyde. Introduced as: new chemical product. Availability: laboratory quantities. Allied Chemical Corp., General Chemical Div.

#### QO METHYLFURAN

##### (2-methylfuran)

$\text{C}_5\text{H}_8\text{O}$ ; M.W., 82.10; Sp.G., 0.913 20/4 C; M.P., -88.68 C; B.P., 63.2-65.6 C at 760 mm. Solubility: 20 C, 0.3 g./100 g. in water; water in, 0.25 g./100 g. Suggested uses: synthetic resin ingredient; solvent; chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. The Quaker Oats Co., Chemicals Div.

#### METHYL ISOPROPYL KETONE, SYNTHETIC

##### (3-methyl-2-butanone)

$\text{C}_5\text{H}_{10}\text{O}$ ; M.W., 86; Sp.G., 0.803; B.P., 92.4-95.2 C; Purity: 93% min. Chemical properties: synthetic material rather than by-product. Suggested uses: organic synthesis; new dyes development. Introduced as: significantly new grade (synthetic). Availability: commercial quantities. Aceto Chemical Co., Inc.

#### METHYL PARATHION, STABILIZED

##### (O,O-dimethyl O-p-nitrophenyl phosphorodithioate)

Constituents: a formulation containing 70% methyl parathion and a unique stabilizer system. Chemical properties: a new form of methyl parathion for the preparation of dusts; protects against the loss of insecticidal activity and greatly extends the storage life of such formulations. Suggested uses: for use in the preparation of dust concentrates and field strength dusts for control of insects on cotton and other approved crops. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

#### N-METHYL PYRROLE

M.W., 81.11; B.P., 112 C; Fr. Pt., 61 F; R.I., n<sub>D</sub><sup>20</sup>, 1.4898. Purity: 98% by gas chromatography; Solubility: in water, 1.3%; water in, 0.4%. Chemical properties: acute oral toxicity probably high; recommend caution. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansul Chemical, Market R & D.

#### N-METHYL PYRROLIDINE

M.W., 85.15; Sp.G., 0.8054; B.P., 80.5 C; R.I., n<sub>D</sub><sup>20</sup>, 1.4265; Fr. Pt., -90 C; Flash Pt., 77 F; Purity: 95%. Chemical properties: undergoes reactions typical of tertiary amines; acute oral LD 50, 0.2 g./kg.; strongly alkaline; breathing vapor and exposure should be avoided. Suggested uses: pharmaceutical and chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansul Chemical, Market R & D.

#### N-METHYL PYRROLIDINE

##### (1-methylpyrrolidine)

M.W., 85.15; R.I., 1.4200-1.4230 at 25 C; Purity: 99% min. Introduced as: product with new

degree of availability. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

#### QO METHYLTETRAHYDROFURAN

##### (2-methyltetrahydrofuran)

$\text{C}_5\text{H}_{10}\text{O}$ ; M.W., 86.13; Sp.G., 0.854 20/4 C; M.P., -136 C; B.P., 80.2 C at 760 mm. Solubility: 25 C, 15.1 g./100 g. in water; water in, 5.3 g./100 g. Chemical properties: in water, has inverse solubility; as a cyclic ether, subject to cleavage by the usual halogen acids yielding 1,4-dihalopentanes which in turn are a source of a variety of 1,4-difunctional compounds; reaction with oxygen forms a peroxide that catalyzes polymerization of methylacrylates, preventing bubble formation. Suggested uses: reaction solvent. Introduced as: product with new degree of availability. Availability: semicommercial quantities. The Quaker Oats Co., Chemicals Div.

#### m-METHYLTHIO ANILINE

$\text{C}_7\text{H}_7\text{NS}$ ; M.W., 139.2; B.P., 110-120 at 1-2 mm. Purity: assay, 98-100%. Chemical properties: a yellow oil. Suggested uses: pharmaceutical intermediate. Introduced as: new chemical product. Availability: commercial quantities. American Cyanamid Co., Fine Chemicals Div.

#### METHYL TRITHION

##### (O,O-dimethyl-S-p-chlorophenylthiomethyl phosphorodithioate)

Density, 1.360 at 20/20 C; Vapor Pressure, 0.003 mm. Hg at 0 C; R.I., n<sub>D</sub><sup>20</sup>, 1.6130. Solubility: very slightly soluble in water at room temperature; miscible with most organic solvents, including ethanol, acetone, cyclohexane and aromatic hydrocarbons. Chemical properties: a nearly colorless liquid apparently ranking among the safer organo phosphorus pesticidal chemicals in mammalian toxicity; shows promise against coleopterous and hemipterous insects. Suggested uses: insecticide and acaricide. Introduced as: new chemical product. Availability: laboratory quantities. Stauffer Chemical Co., Agricultural Chemical Div.

#### MICHEL XO-20

Chemical properties: non toxic, antistatic coating agent; water-dispersible and nonflammable. Suggested uses: antistatic treatment of motion picture film, recording tape, plastic sheeting—by surface coating (spraying and dipping). Introduced as: new chemical product. Availability: semicommercial quantities. M. Michel and Co., Inc.

#### MICHEL XO-39

##### (low-foam alkyl aryl sulfonate)

Chemical properties: liquid; high wetting properties with limited foaming; stable in presence of acids and alkalis. Suggested uses: used where excessive foaming of conventional surfactants is undesirable. Introduced as: new chemical product. Availability: commercial quantities. M. Michel and Co., Inc.

#### MICHEL XO-43

Chemical properties: softens paper in low concentrations without changing colors or affecting storage life. Suggested uses: as treating agent during mill processing of paper toweling and tissue. Introduced as: new chemical product. Availability: commercial quantities. M. Michel and Co., Inc.

#### MICRIA® AD

##### (aluminum oxide)

$\text{Al}_2\text{O}_3$ ; Bulk Density, 9 lbs./cu. ft.; Flake Particles, 0.02 x 3 microns. Suggested uses: ceramics, reinforcing agent, catalyst carrier, flow agent thickening. Introduced as: significantly new grade. Availability: semicommercial quantities. Monsanto Chemical Co., Research and Engineering Div.

#### MICRIA® AL

##### (aluminum oxide)

$\text{Al}_2\text{O}_3$ ; Bulk Density, 2 lbs./cu. ft.; Oil Absorption, 180 parts linseed/100 parts sample; Average Particle Size, 0.02 microns x 3 microns. Purity: 96%. Suggested uses: thickener, insulator, catalyst carrier, polishing agent, reinforcing agent. Introduced as: significantly new grade. Availability: semicommercial quantities. Monsanto Chemical Co., Research and Engineering Div.

#### MICRIA® TIS

##### (titanium dioxide)

$\text{TiO}_2$ ; Bulk Density, 50 lbs./cu. ft.; Surface Area, 15 sq. m./g.; Particle Size, 0.11 microns average. Purity: 99%. Suggested uses: ceramics, whitening, reinforcing agent. Introduced as:



significantly new grade. Availability: semicommercial quantities. Monsanto Chemical Co., Research and Engineering Div.

#### MICRIA® ZR (aluminum oxide)

Al<sub>2</sub>O<sub>3</sub>; Bulk Density, 8 lbs./cu. ft. Flake Particle, 0.1 micron x 2.5 microns; Surface Area, 15 sq. m./gram. Suggested uses: ceramics, reinforcing agents, thickening agent, reinforcing glazes and porcelain. Monsanto Chemical Co., Research and Engineering Div.

#### MOD-EPOX®

Sp.G., 1.180 30/15.5; M.P., 25 C; B.P., 360 C at 760 mm.; Viscosity, 17.5 cps. at 25 C. Chemical properties: clear, oily liquid. Suggested uses: reactive diluent for liquid epoxy resins; curing agent accelerator. Introduced as: product with new degree of availability. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

#### 3-MONOALLYL BARBITURIC ACID

C<sub>7</sub>H<sub>9</sub>O<sub>3</sub>; M.W., 140.14; M.P., 164-166 C. Purity: 99% min.; Solubility: insoluble in water; soluble in alcohols and sodium hydroxide solutions. Chemical properties: contains one reactive hydrogen atom that may be replaced to produce a barbiturate; allyl group is reactive. Suggested uses: as an intermediate in the production of a finished barbiturate; may also prove useful in the production of other types of pharmaceuticals, tobacco flavors, resins, etc. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### MONOALLYL DIETHYL MALONATE

C<sub>15</sub>H<sub>19</sub>O<sub>4</sub>; M.W., 200.24; Sp.G., 1.0069 at 25/25 C. Purity: 98%; Solubility: insoluble in water; soluble in alcohols, ethers, ketones, etc. Chemical properties: colorless liquid with an aromatic odor; contains a reactive methylene hydrogen that may be converted to a sodium salt by means of sodium ethylate; ester may be decarboxylated to an acid. Suggested uses: intermediate for production of barbiturates and other type medicinal chemicals; valuable intermediate for production of all types of organic compounds. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

#### MONO-MUL

Chemical properties: liquid, edible emulsifier with very bland odor and taste. Suggested uses: ice cream emulsifier or wherever a high-grade edible, liquid surface-active agent is needed. Introduced as: new chemical product. Availability: commercial quantities. Carlisle Chemical Works.

#### MORFLEX X-1118

##### (acetyl tri-n-octyl/decyl citrate)

M.W., 597 (calc.); Sp.G., .9711; R.I., 1.4500. Purity: 97%; Solubility: insoluble in water. Chemical properties: extremely low volatility with excellent low temperature properties. Suggested uses: plasticizers, PVC, non-fogging plasticizer for automotive upholstery. Introduced as: new chemical product. Availability: commercial quantities. Chas. Pfizer & Co., Inc., Greensboro Sales Dept.

#### MORGUM

##### (hydroxyethyl potato starch)

Constituents: purified ethers of potato starch of variously uniform degrees of substitution. M.W., over 100,000. Purity: less than 0.3% ash. Chemical properties: substantially neutral ether of potato starch having improved film strength, clarity, grease and oil resistance; viscosity varies with degree of substitutions and depolymerization. Suggested uses: paper coating, beater additive, textile finish (reactive with urea resins), print thickener, soil stabilizer. Introduced as: new chemical product. Availability: commercial quantities. Morningstar-Paisley, Inc., Textile Div.

#### MORPATEx 50 & 56

Constituents: a mixture of thermosetting copolymers in an aqueous system. Chemical properties: durable to wash and dry cleaning; light fast. Suggested uses: metallic pigment binder. Introduced as: new chemical product. Availability: commercial quantities. Morningstar-Paisley, Inc., Textile Div.

#### MYKON 449

##### (short-chain polyamide complex)

Constituents: polyamide dispersed in water. Purity: 35% dry matter; Solubility: easily dispersible in water at 125 F. pH, 4.5. Chemical properties: cationic textile softener. Suggested uses: to impart soft hand on cellulose, especially on fabrics finished with resin formulations,

with outstanding resistance to yellowing at high temperatures; product is also an efficient anti-static agent for orlon, nylon, dacron and similar hydrophobic fibers. Introduced as: new chemical product. Availability: commercial quantities. Warwick Chemical Co., Div. Sun Chemical Corp.

#### MYKON 452

Constituents: synthetic wax emulsion. Sp.G., 0.99. Purity: 25% dry matter; Solubility: dispersible with water and compatible with conventional finishing agents. Chemical properties: imparts a soft, silky hand to resin-treated cellulosic textiles. Suggested uses: as a softener for wash-and-wear treated cellulosic fabrics; fabric so treated will have improved sewability, tear strength, abrasion resistance and outstanding resistance to yellowing by heat. Introduced as: new chemical product. Availability: commercial quantities. Warwick Chemical Co., Div. Sun Chemical Corp.

#### NAFIL CR

##### (polyisocyanate resins)

Chemical properties: very low viscosities (less than 6,000 cps. at 77 F) produce rigid polyurethane foams with outstanding physical properties. Suggested uses: thermal insulation, structural reinforcement, boat flotation, fuel tanks, building panels. Introduced as: significantly new grade. Chase Chemical Corp.

#### NAPHTHOQUINONE (TECHNICAL GRADE) (1,4 naphthoquinone)

C<sub>10</sub>H<sub>6</sub>O<sub>2</sub>; M.W., 158; Setting Pt., 123.5 C. Purity: 98.5 min. (dry). Chemical properties: 5% maximum water. Suggested uses: chemical synthesis. Introduced as: significantly new grade, product with new degree of availability. Availability: laboratory quantities, commercial quantities (2nd quarter 1960). American Cyanamid Co., Organic Chemicals Div.

#### NERONE

Constituents: optically active menthenyl ketone. Sp.G., 25/25, 0.910-0.915; Opt. Rot., -30 to -100; R. I., 1.465-1.475; Carbonyl Value, 265-285. Solubility: soluble in most perfume materials and solvents except propylene glycol. Suggested uses: pure, synthetic aromatic chemical possessing an intense neroli-citrus odor of unusual stability. Introduced as: new chemical product. Availability: semicommercial quantities. Givaudan-Delawanna, Inc.

#### NEVILLITE

M.W., 850; Sp.G., 1.011; Ring and Ball M.P., 117 C; Saybolt Color, +27 (50 wt. % solution in water-white solvent). Solubility: readily soluble in aromatic, paraffinic, naphthenic, and terpene hydrocarbons; chlorinated hydrocarbons. Chemical properties: water-white, synthetic hydrocarbon resin of linear polycycloalkane chemical structure; thermoplastic; chemically inert; excellent heat and after yellowing stability; completely compatible with polyethylene, polystyrene, and Vistanex. Suggested uses: superior tack-producing resin in adhesive formulations; filler, softener, and tack-producer for rubber; protective coatings. Introduced as: new chemical product. Availability: laboratory quantities. Neville Chemical Co.

#### NEW MONOSODIUM PHOSPHATE, ANHYDROUS

Na H<sub>2</sub>PO<sub>4</sub>; M.W., 120; P<sub>2</sub>O<sub>5</sub>, 49.7; total Na<sub>2</sub>O, 43.39. Purity: 99+; Solubility: 40 parts by weight per 100 parts water. Chemical properties: porous granular product that dissolves more rapidly in water than crystalline granular products previously offered. Suggested uses: metal phosphatizing compounds, dry dairy cleaners. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Div.

#### NIAX® DIOL PPG-3025

##### (polyoxy propylene glycol)

HO(C<sub>3</sub>H<sub>6</sub>O)<sub>5</sub>H; M.W., 3,000; Hydroxyl No., 38.5. Suggested uses: polyether intermediate for use as a starting molecule for urethane polymers; used alone or in combination with NIAx triols; offers a new dimension in formulating latitude for polyurethane foams, elastomers, and coatings. Introduced as: new chemical product. Availability: commercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### NIAX® DIOL PPG-4025

##### (polyoxy propylene glycol)

HO(C<sub>3</sub>H<sub>6</sub>O)<sub>7</sub>H; M.W., 4,000; Hydroxyl No., 30.5. Suggested uses: polyether intermediate for use as a starting molecule for urethane polymers; used alone or in combination with NIAx triols; offers a new dimension in formulating latitude for polyurethane foams, elastomers, and coatings. Introduced as: new chemical product.

Availability: commercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### NITRILOTRIACETIC ACID

##### (triglycollic acid)

N(CH<sub>2</sub>COOH)<sub>3</sub>; M.W., 191; M.P., 220-260 C. Solubility: slightly soluble in water and methanol; insoluble in other common solvents. Suggested uses: chemical intermediate. Introduced as: significantly new grade. Availability: laboratory quantities. The Dow Chemical Co., Technical Service and Development Div.

#### NITROPHENIDE

##### (bis(m-nitrophenyl)disulfide)

C<sub>12</sub>H<sub>8</sub>N<sub>2</sub>O<sub>2</sub>S<sub>2</sub>; M.W., 308.33; Setting Point: not below 76.0 C; Moisture: not more than 2.5%; Heavy Metals: not more than 20 ppm.; Sulfated Ash: not more than 0.50%. Purity: assay, not less than 96.0% on the "as is" basis; Solubility: freely soluble in ether; less soluble in alcohol; insoluble in water. Chemical properties: yellow-tan crystals. Suggested uses: pharmaceutical intermediate. Introduced as: product with new degree of availability. Availability: commercial quantities. American Cyanamid, Fine Chemicals Div.

#### 3-NITROSALICYLIC ACID, METHYL ESTER

C<sub>8</sub>H<sub>7</sub>NO<sub>3</sub>; M.W., 197; M.P., 130 C. Purity: 98.5% min.; Solubility: insoluble in water; soluble in organic solvents. Suggested uses: pharmaceutical intermediate; dye intermediate. Introduced as: significantly new grade. Availability: commercial quantities. Aceto Chemical Co., Inc.

#### 4-NITRO-3-TRIFLUOROMETHYLPHENOL

C<sub>7</sub>H<sub>4</sub>NO<sub>3</sub>F<sub>3</sub>; M.W., 207. Purity: approx. 80% (dry basis); Solubility: soluble in aqueous alkali, limited solubility in water. Chemical properties: wet oil containing approx. 25% water. Suggested uses: bactericide, fungicide, chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Maumee Chemical Co.

#### NOPCOSORB I

##### (substituted benzophenone)

Sp.G., 1.030 at 25 C. Purity: 100% mixed benzophenones; Solubility: soluble in all common organic solvents. Chemical properties: high spectral absorption, in dilute solution, especially of long wave length UV radiation; exceptional compatibility with wide range of plastics including polypropylene; maintains UV absorption ability even at prolonged high temperatures. Suggested uses: stabilization of polymers against ultraviolet degradation. Introduced as: new chemical product. Availability: semicommercial quantities. Nopco Chemical Co., Chemical Development Div.

#### NOVOLDIAMINE

##### (1-diethylamino-4-aminopentane)

C<sub>9</sub>H<sub>22</sub>N<sub>2</sub>; M.W., 144; Sp.G., 0.82; B.P., 142-144 C; Purity: 94% min.; Solubility: slightly soluble in water; miscible with organic solvents. Chemical properties: has reactive hydrogen in 4-amino group. Suggested uses: synthesis of medicinals such as Chloroquine and Quinacrine. Introduced as: product with new degree of availability. Availability: commercial quantities. Chemo Puro Mfg. Corp.

#### OCTADECYL ISOCYANATE, TECHNICAL (TONCO)

Constituents: C<sub>18</sub>, 68%; C<sub>16</sub>, 24%; C<sub>14</sub>, 2%. Sp.G., 0.86 (approx.); M.P., 15 C (approx.); B.P., 170 C at 2 mm.; Amine Equivalent, 300-305. Purity: 95% isocyanate; Solubility: soluble in aromatic hydrocarbons; reacts with water. Suggested uses: surface treatment of textile fibers for stability and waterproofing. Introduced as: product with new degree of availability. Availability: laboratory quantities. The Carwin Co.

#### OMAMID C (polyamide resin)

Sp.G., 0.94-0.96 at 20/20 C; Softening Pt. (ring and ball), 110-120 C. Solubility: soluble to the extent of 20-30% in 3 to 4 carbon monohydric alcohols; insoluble in water. Chemical properties: a tough thermoplastic resin; can be readily dispersed in many solvent systems to produce gel structures that are thixotropic. Suggested uses: thixotropic bodying agents for surface coatings and paint vehicles; the resin component of flexographic inks, heat seal coatings and overprint varnishes; adhesive formulation. Introduced as: new chemical product. Availability: commercial quantities. Olin Mathieson Chemical Corp., Organic Chemicals Div.

#### OMAMID S (polyamide resin)

Sp.G., 0.97-0.99, 0.94-0.96 at 20/20 C; Softening Pt. (ring and ball), 110-120, 90-100. Solubility: soluble to the extent of 20-30% in 3 to

# 4.37 NEW CHEMICALS FOR INDUSTRY

8 carbon monohydric alcohols; insoluble in water. Chemical properties: a tough thermoplastic resin; can be readily dispersed in many solvent systems to produce gel structures that are thixotropic. Suggested uses: thixotropic bodying agents for surface coatings and paint vehicles; the resin component of flexographic inks, heat seal coatings and overprint varnishes; adhesive formulation. Introduced as: new chemical product. Availability: commercial quantities. Olin Mathieson Chemical Corp., Organic Chemicals Div.

## ORTHOXYLENE—99%

$C_8H_8(CH_3)_2$ ; IBP: 143 C min. at 760 mm.; Dry Pt.: 145 C max. at 760 mm. Purity: 99%; Chemical properties: free of  $H_2S$  and  $SO_2$ ; copper strip will not show iridescence or discoloration. Suggested uses: oxidation to phthalic acid, phthalic anhydride; partial oxidation to orthoformic acid. Introduced as: significantly new grade, product with new degree of availability. Availability: commercial quantities. Caden Petroleum Corp.

## PENNOX B (hindered bis-phenol)

Sp.G., 0.98 at 25/25 C; Av. Wt. Per Gal., 8.2 lb. Chemical properties: slightly viscous liquid; good storage stability; brown to dark brown color. Suggested uses: rubber antioxidant. Introduced as: new chemical product. Availability: commercial quantities. Pennsalt Chemicals Corp., Industrial Chemicals Div.

## PENNOX C (hindered bis-phenol)

Sp.G., 0.93 at 25/25 C; Av. Wt. Per Gal., 7.7 lb. Chemical properties: moderately viscous liquid; good storage stability; light amber to amber color. Suggested uses: rubber antioxidant. Introduced as: new chemical product. Availability: commercial quantities. Pennsalt Chemicals Corp., Industrial Chemicals Div.

## PENNOX D (hindered bis-phenol)

Sp.G., 0.92 at 25/25 C; Av. Wt. Per Gal., 7.7 lb. Chemical properties: moderately viscous liquid; good storage stability; amber to brown color. Suggested uses: rubber antioxidant. Introduced as: new chemical product. Availability: commercial quantities. Pennsalt Chemicals Corp., Industrial Chemicals Div.

## PENNSALT AE-16S

Constituents: caustic soda plus chelating agents. Chemical properties: solid form for ease of handling and economy. Suggested uses: aluminum etching. Introduced as: significantly new grade. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Div.

## PENTACHLOROPENTADIENOIC ACID

$C_5HCl_5O_2$ ; M.W., 270.29; M.P., 127 C; Purity: greater than 95%; Solubility: approx. 18% in carbon tetrachloride at 24 C. Chemical properties: available as the *cis* isomer; unique perhalogenated acid with a conjugated olefinic structure; cyclization to the lactone occurs readily. Suggested uses: in the agricultural field and as a chemical intermediate. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Hooker Chemical Corp., Product Development.

## PERMAFRESH 193 (dimethylol urea)

$CO(NHCH_2OH)_2$ ; Constituents: a creamy paste of dimethylol urea in water. M.W., 120; Sp.G., 1.18; Purity: 50-52%; Solubility: clear solution in equal weight of warm water. Chemical properties: thermosetting reactant resin. Suggested uses: to produce wash and wear properties on cellulosic textiles, as well as durable shrinkage control and crush resistance with minimum losses in strength and light fastness. Introduced as: significantly new grade. Availability: commercial quantities. Warwick Chemical Co., Div. Sun Chemical Corp.

## PERMAFRESH CATALYST X-4

Sp.G., 1.25; pH, 1.5. Solubility: miscible with water. Chemical properties: complex metal salts solution; clear, odorless. Suggested uses: as a fast acting, highly efficient curing agent in

chlorine-resistant thermosetting resin applications on cellulosic fabrics. Introduced as: significantly new grade. Availability: commercial quantities. Warwick Chemical Co., Div. Sun Chemical Corp.

## PERMAFRESH CATALYST X-8

Sp.G., 1.43; Solubility: soluble in warm water. Chemical properties: buffered metal salt complex; white, viscous paste. Suggested uses: as a fast acting, highly efficient curing agent in chlorine-resistant thermosetting resin applications on cellulosic fabrics; especially useful to minimize odor problems. Introduced as: significantly new grade. Availability: commercial quantities. Warwick Chemical Co., Div. Sun Chemical Corp.

## PERMANSA YELLOW: G 12171, M 12172, G 12173, M 12174

### (hansa yellows)

Sp.G., 1.2171, 1.38; 12172, 1.41; 12173, 1.45; 12174, 1.38. Purity: commercial; Chemical properties: 12171 and 12172 are used for tints only; they have maximum strength without sacrificing brightness and light resistance of full shade. 12173 and 12174 are used in full shade and have minimum oil absorption and maximum opacity without sacrificing brightness and light resistance. Suggested uses: in all types of yellow and green enamels where lead is not permitted; their low specific gravity is advantageous in blending with phthalocyanine blues or iron blues, thus eliminating the settling difficulties encountered with chrome yellows. Introduced as: new chemical products. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

## PERMANSA YELLOW: LEMON 12182, MEDIUM 12183

### (hansa yellow)

Sp.G., 1.2182, 1.45; 12183, 1.41. Purity: commercial; Chemical properties: good working properties; distinctive shades; good resistance to mineral spirits. Suggested uses: in paint tinting systems where their lower oil absorption and better resistance to mineral spirits make them more desirable than regular G (lemon) or M (medium) shade hansa yellows. Introduced as: new chemical products. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

## PERMANSA YELLOW: PRIMROSE 12180, 12181

### (hansa yellows)

Sp.G., 1.2180, 1.53; 12181, 1.42. Purity: commercial. Chemical properties: outstanding for cleanness. Suggested uses: in all types of inks and water colors and tempera paints; used with blues to make greens, they produce much clearer greens than benzidine yellows. Introduced as: new chemical products. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

## PETRO-AD SPECIAL

Constituents: alkyl naphthalene sulfonate, defoaming agent. M.W., 260; Sp.G., powder, 0.5; liquid, 1.2; percent active: powder, 96-98; liquid, 50. Solubility: easily soluble in water, alcohol, and in aqueous solutions of sodium hydroxide, hydrochloric acid, sulfuric acid, etc. Chemical properties: very low foam in end use concentrations. Suggested uses: active constituent in machine dishwashing formulations. Introduced as: new chemical product. Availability: commercial quantities. Universal Detergents Inc., Petrochemicals Co., Div.

## PHENAZOCINE HYDROBROMIDE (NIH 7519)

### (2'-hydroxy-5,9-dimethyl-2-(2-phenethyl)-6,7-benzomorphan hydrobromide)

$C_{22}H_{27}ON \cdot HBr$ ; M.W., 402.4; Solubility: 0.24 grams per 100 ml. water. Suggested uses: analgesic. Introduced as: new chemical product. Availability: commercial quantities. Mallinckrodt Chemical Works.

## PHILPRENE® 1502-M

Constituents: a blend of PHILPRENE 1502 rubber and MARLEX® polyethylene. Sp.G., 0.94-0.95; Chemical properties: compounded stocks have excellent resistance to abrasion, tear, and crack growth. Suggested uses: shoe sole stocks and mechanical goods. Introduced as: new chemical product. Availability: commercial quantities. Phillips Chemical Co., Rubber Chemicals Div.

## PHILPRENE® X-2

### (polybutadiene rubber, cis content approximately 80%)

Sp.G., 0.91; Gehman Fr. Pt., -97 C. Suggest-

ed uses: properties that indicate outstanding possibilities for low temperature applications. Introduced as: new chemical product. Availability: laboratory quantities. Phillips Petroleum Co., Market Development Div.

## PHILPRENE® X-10

### (trans-polybutadiene rubber)

Sp.G., 0.93-0.96; Chemical properties: compounded stocks can have outstanding abrasion resistance, high modulus, good resilience and low compression set. Suggested uses: gasket stocks, golf ball covers, battery cases, shoe soles. Introduced as: new chemical product. Availability: laboratory quantities. Phillips Petroleum Co., Market Development Div.

## PHILPRENE® X-40

### (a controlled structure 75/25 butadiene/styrene copolymer)

Sp.G., 0.92; Chemical properties: compounded stocks are exceptionally easy to process, exhibit high extrusion rates, good electric properties, very low freeze points, very low shrinkage and smooth, glossy appearance. Suggested uses: wire and cable, hose, extruded goods. Introduced as: new chemical product. Availability: laboratory quantities. Phillips Petroleum Co., Market Development Div.

## PHOBOTEX FTC

Chemical properties: produces fast-to-washing water repellency with little or no effect on air permeability; effective on all natural and man-made fibers, and may be applied alone or in combination; no unpleasant odors develop in processing when used alone, and it is not necessary to wash the goods after curing. Suggested uses: with urea-formaldehyde or melamine-formaldehyde resins for wash-and-wear or drip-dry finishes. Introduced as: new chemical product. Availability: commercial quantities. Ciba Co., Inc., Chemical Specialties Div.

## PTHALIMIDE (o-phthalimide)

$C_8H_5NO_2$ ; M.W., 147.13; M.P., 238 C; Suggested uses: insecticide intermediate. Introduced as: product with new degree of availability. Availability: commercial quantities. Anderson Chemical Co., Div. Stauffer Chemical Co.

## PICCOTEX

Constituents: copolymer of styrene homologues. Sp.G., 1.06; M.P., 100 C, 120 C (B & R); Solubility: complete in aromatics and low Solubility: complete in aromatics and low ties: thermoplastic, neutral hydrocarbon resin; water white; hard, dry; negligible acid and saponification numbers and iodine value. Introduced as: new chemical product. Availability: commercial quantities. Pennsylvania Industrial Chemical Corp.

## 3-PIPERIDINOPROPIONPHENONE HYDROCHLORIDE

$C_{14}H_{19}NO \cdot HCl$ ; M.W., 253.78; M.P., 187 C; Purity: 98%; Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

## POLYETHER ACID B-4

Constituents: resinous product of 5 mols diphenolic acid coupled with 4 mols dichlorobutane. M.W., 1646 theoretical; M.P., 95-105 C; Acid Value, 140-150. Chemical properties: a linear pentabasic acid with ether linkages having two terminal phenolic hydroxyl groups. Suggested uses: chemical and resin intermediate. Introduced as: new chemical product. Availability: laboratory quantities. S. C. Johnson & Son, Inc., Service Products Div.

## POLYETHER ACID E-3

Constituents: resinous product of 4 mols diphenolic acid coupled with 3 mols epichlorohydrin. M.W., 1312 theoretical; M.P., 95-105 C; Acid Value, 155-165. Chemical properties: a linear tetrabasic acid with ether linkages having two terminal phenolic hydroxyl groups and three evenly spaced hydroxyl groups on the chain. Suggested uses: chemical and resin intermediate. Introduced as: new chemical product. Availability: laboratory quantities. S. C. Johnson & Son, Inc., Service Products Div.

## POLYETHER ACID N-1

Constituents: resinous product of 2 mols diphenolic acid coupled with 1 mol dichloroethyl ether. M.W., 642 theoretical; M.P., 70-80 C; Acid Value, 155-165. Chemical properties: a linear dibasic acid with ether linkages having two phenolic hydroxyl groups. Suggested uses: polyesters, laminating and surface coating, alkyls to improve drying time and increase viscosity without tendency to gel, as a dibasic acid. Introduced as: new chemical product. Availability: semicommercial quantities. S. C. Johnson & Son, Inc., Service Products Div.

### POLYETHER ACID N-3

Constituents: resinous product of 4 mols diphenolic acid coupled with 3 mols dichloroethyl ether. M.W., 1354 theoretical; M.P., 80-90 C.; Acid Value, 145-155. Chemical properties: a linear tetra basic acid with ether linkages having two terminal phenolic hydroxyl groups. Suggested uses: modified rosin esters, nitrocellulose lacquer resins, printing ink resins, varnish resins, epoxy curing agent, as a tetra basic acid. Introduced as: new chemical product. Availability: semicommercial quantities. S. C. Johnson & Son, Inc., Service Products Div.

### POLYETHYLENE FOAM (LOW DENSITY)

Constituents: polyethylene and a blowing agent. Apparent Density: 2.0 to 2.2 lbs./cu.ft.; Apparent Sp.G., 0.032 to 0.035. Water adsorption (Dow CS-PSF-E) <0.10 lbs./sq.ft. of surface area; Water Vapor Transmission, (Dow CS-PSF-F) <1.0 perm-in. (grains/sq.ft./in. thickness/hr./in. Hg. Chemical properties: excellent chemical stability; flexibility over a wide temperature range; excellent strength and toughness; low water absorption; light weight; good insulation value; no odor; low moisture vapor transmission; easily fabricated. Suggested uses: buoyancy applications, packaging, seals and gaskets, shock absorption, thermal insulation, toys, novelties and displays. Introduced as: significantly new grade. Availability: commercial quantities. The Dow Chemical Co., Plastics Dept.

### POLYLITE POLYESTER RESINS 8702 AND 8703 (unsaturated polyester resins)

Viscosity, 500-1000 cps.; Solids, 100%; Color, 4 max.; Gel time, 10-20 min. Acid No., 25 max. (8702), 40 max. (8703); Sp.G., 8.9 lbs./gal. (8702), 9.15 lbs./gal. (8703). Chemical properties: unsaturated polyester resins used without conventional fiberglass reinforcement allow the formulation of oil-free surface coatings. Suggested uses: these coatings are especially suited to furniture finishes as they can be applied at or near 100% non-volatile content to yield surfaces that are resistant to chemicals and solvents, light and weathering, abrasion and wear. Introduced as: new chemical product. Availability: semicommercial quantities. Reichhold Chemicals, Inc.

### POLYPHENYL ETHER

(bis (phenoxy phenoxy) benzene)

$C_{12}H_{10}O_4$ , M.W., 446; Density, 1.19 at 100 F; B.P., 950 F. Solubility: soluble in hydrocarbons. Chemical properties: isomeric mixture; thermal stability, oxidative stability, wide liquid range, high boiling, good lubricant, nucleon radiation resistant. Suggested uses: high-temperature hydraulic fluid and/or lubricant. Introduced as: new chemical product. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Div.

### POLY-TERGENT LF 400 (polyethenoxy ether)

Sp.G., 1.029 at 30 C. Solubility: soluble in water, alcohols, dilute sulfuric acid, hydrochloric acid and many other organic solvents. Chemical properties: a nonionic surfactant with very low foaming characteristics; compatible with soaps, anionics, cationics and the nonionic surfactants. Suggested uses: component of automatic dishwashing formulations; a rinse aid for automatic dishwashers; a component of metal cleaning compounds; a foam retardant. Introduced as: new chemical product. Availability: commercial quantities. Olin Mathieson Chemical Corp., Organic Chemicals Div.

### POTASSIUM ACETATE, 65% SOLUTION

$CH_3COOK$ ; M.W., 99; Purity: 65% min.; Solubility: miscible with water and ethanol. Suggested uses: as a convenient-to-use, low cost replacement for crystalline potassium acetate. Introduced as: significantly new grade. Availability: commercial quantities. Chemo Puro Mfg. Corp.

### POTASSIUM BOROHYDRIDE PELLETS

$KBH_4$ ; Sp.G., 5 lb./gal.; #566, 24/32 in. diameter. Purity: 97%; Solubility: soluble in water. Chemical properties: eliminates dust problems. Suggested uses: potassium borohydride applications requiring pellet form; especially suited to fixed-bed applications. Introduced as: significantly new grade. Availability: commercial quantities. Metal Hydrides, Inc., Chemicals Div.

### PRODUCTOL XYLENOL GRADE XL-48

Constituents: mixture of 2,4 xyleneol and 2,5 xyleneol. M.W., approx. 136; Sp.G., 1.023 at 60 F; M.P., approx. 35.5 C; B.R., 2% to 95% = 211.6 to 213.1 C. Purity: over 86% 2,4 and 2,5 xyleneols in mixture. Suggested uses:

alkylation with isobutylene, resin formulations, esterification. Introduced as: significantly new grade. Availability: commercial quantities. Productol Co.

### n-PROPYL DIETHYL MALONATE

$C_{10}H_{18}O_4$ ; M.W., 202.25; Purity: 98%; Solubility: insoluble in water; soluble in alcohols, ethers, esters and ketones. Chemical properties: colorless liquid with an aromatic odor; contains a reactive methylene hydrogen atom replaceable with sodium by means of sodium ethylate. Suggested uses: as an intermediate in the production of barbiturates and other valuable medicinal chemicals; as a tobacco flavoring agent. Introduced as: new chemical product. Availability: commercial quantities. Benzol Products Co.

### 1,3-PROPYLENE GLYCOL (trimethylene glycol)

$C_3H_8O_2$ ; M.W., 76; Sp.G., 1.0537; B.P., 210-211 C; Pure grade, colorless, odorless; Tech. grade, light yellow. Purity: pure grade, 99%; tech. grade, 95%. Suggested uses:  $\beta$ -propiolic group; intermediate in organic and pharmaceutical synthesis. Introduced as: product with new degree of availability. Availability: commercial quantities. Aceto Chemical Co., Inc.

### PVP/VA I-735

(vinylpyrrolidone/vinyl acetate copolymer 50% in isopropanol)

Monomer Ratio, 70% vinylpyrrolidone; 30% vinyl acetate. Purity: 50% active; Solubility: miscible with most classes of solvents. Chemical properties: forms water-removable films that feature adhesiveness, transparency, luster and hardness. Suggested uses: noncosmetic protective films, antitarnish coatings, shoe polishes, protective leaf-shine sprays, tablet coatings; tinted decorative sprays. Introduced as: new chemical product. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Div.

### PVP/VA S-630

(vinylpyrrolidone/vinyl acetate copolymer)

M.W., 40,000-133,000; Monomer Ratio, 60% vinylpyrrolidone; 40% vinyl acetate. Purity: 100% active; Solubility: soluble in many organic solvents; dispersible in water; insoluble in methyl isobutyl ketone, sec-butyl acetate, carbon tetrachloride, tetrachloroethylene, 1,1,1-trichloroethane, benzene, toluene, xylene. Chemical properties: white, spray-dried powder, free of objectionable odor; forms films that feature adhesiveness, transparency, luster, hardness, and water rewettability. Suggested uses: where a dry, high-molecular-weight, solvent-soluble, water-redispersible copolymer is required or where water and alcohol must be avoided. Introduced as: new chemical product. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Div.

### PVP/VA W-464

(vinylpyrrolidone/vinyl acetate copolymer, 40% aqueous emulsion)

M.W., 160,000; Monomer Ratio, 45% vinylpyrrolidone; 55% vinyl acetate. Purity: 40% active; Solubility: soluble in methanol, ethanol, acetone, ethyl acetate. Chemical properties: white, viscous, aqueous emulsion—forms water-removable films that are milky white, glossy and translucent. Suggested uses: adhesives, heat-set inks, paints, textile sizes, glass-fiber-reinforcing sizes, soil suspending agents in paper coating, viscosity stabilizer. Introduced as: new chemical product. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Div.

### PYDRAUL A200

Sp.G., 1.43 at 60/60 F. Chemical properties: non-aqueous, synthetic hydraulic fluid free of all petroleum products. Suggested uses: fire-resistant hydraulic fluid and lubricant. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

### PYRROLE

$C_4H_5N$ ; M.W., 67.09; Sp.G., 0.9680; M.P., -24 C; B.P., 131 C; R.T., n<sub>D</sub>20, 1.5091; Flash Pt., 102 F. Purity: 95% by gas chromatography; Solubility: at 25 C, in water, 6 gms./100 gms.; water in, 3 gms./100 gms. Chemical properties: acute oral toxicity relatively high, recommend caution. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Ansul Chemical, Market R & D.

### 3-PYRROLIDINOPROPIONOPHENONE HYDROCHLORIDE

[3-(1-pyrrolidinyl) propiophenone]

239.74; M.W., 160-166 C; Purity: 95% min.;

Chemical properties: 14.5% HCl. Introduced as: new chemical product. Availability: commercial quantities. Eli Lilly & Co., Industrial Products Div.

### RANDOX-T®, SELECTIVE HERBICIDE (a-chloro-N,N-diallylacetamide and trichlorobenzylchloride)

Constituents: a mixture of the two pre-emergent herbicides available as an emulsifiable concentrate and in granular form. Chemical properties: includes a new herbicide and extends the effectiveness of Randox as a pre-emergent selective herbicide for grassy weeds to broad leaf weeds as well. Suggested uses: for weed control of both grasses and broadleaves in corn, without danger of corn injury or soil residues toxic to other crops in succeeding years. Introduced as: new chemical product. Availability: commercial quantities—starting in spring of 1960. Monsanto Chemical Co., Organic Div.

### REDISOL

(processed pregelatinized starches)

Constituents: drum dried potato and tapioca derivatives. Purity: meets NCA specifications; Solubility: cold water dispersible. Chemical properties: drum-dried starch thickeners, cold swelling, acid and heat stable with exceptional organoleptic properties. Suggested uses: instant and convenience foods, instant puddings, non-cook-up pie fillings, toppings, desserts. Introduced as: significantly new grade. Availability: commercial quantities. Morningstar-Paisley, Inc., Food Products Div.

### RESILITH

Chemical properties: tests conducted showed excellent resistance to a number of acidic and basic chemicals, solvents, petroleum products, vegetable oils, foods, soaps and detergents; surface does not powder; offers high point load and impact strength. Suggested uses: heavy-duty industrial flooring. Introduced as: new chemical product. Availability: commercial quantities. Borden Chemical Co.

### RESIN 36 (hydantoin formaldehyde resin)

Sp.G., 1.19 C at 25 C; M.P., -5 C; B.P., polymerize on heat pH, 8.5 to 9.5; Purity: 83% active ingredient; Solubility: soluble in all proportions with cold or warm water; and ethanol. Chemical properties: pale yellow solution; odor of formaldehyde; insolubilizes and hardens rapidly at 170 C. Suggested uses: as a water-soluble resin that insolubilizes and hardens rapidly at 170 C. Introduced as: new chemical product. Availability: commercial quantities. Glyco Chemicals, Div. Chas. L. Huisking & Co., Inc.

### RESIN D-243

(polyvinyl acetate-dibutyl maleate copolymer emulsion)

Total Solids: 54.5% min.; Emulsion Viscosity: 1000-1400 cps.; Particle Size: 0.5 microns average, most 0.2-1.2 microns. Chemical properties: heterogeneous particle size distribution; ease of compounding; excellent adhesion to surfaces such as polystyrene; excellent stability towards organic solvents and inorganic salts. Suggested uses: adhesives, paper coating, textile finishing, cement additives and paints. Introduced as: significantly new grade. Availability: semicommercial quantities. Shawinigan Resins Corp., Product Development Dept.

### RESINOX SC-1013

(phenol-formaldehyde resin)

Chemical properties: a silane modified phenol-formaldehyde resin that retains its strength after exposure to temperatures of 600 F for hundreds of hours; possesses high frequency electrical properties and high temperature performance characteristics. Suggested uses: developed especially for use with fibrous glass and asbestos reinforcements to make radomes for supersonic aircraft. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co.

### RESLOOM E-83 (textile resin)

Chemical properties: a non-chlorine retentive resin finish for wash-and-wear cottons, resists discoloration from scorching and washing; a pre-catalyzed heterocyclic nitrogenous resin supplied as a clear, low viscosity water-white liquid; it does not yellow with chlorine or pick up laundry soil during washing. Suggested uses: particularly recommended for white cotton fabrics. Introduced as: significantly new grade. Availability: commercial quantities. Monsanto Chemical Co.

### RHONITE D-12

Solubility: infinitely soluble in water. Chemical properties: 45% active aqueous solution of a thermosetting resin; maximum chlorine resistance. Suggested uses: crease resistant and/or



# 4. NEW CHEMICALS FOR INDUSTRY

wash-war finish where maximum chlorine resistance is desired. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Textile Div.

## RHONITE N-17

Solubility: infinitely soluble in water. Chemical properties: 50% active aqueous solution of a thermosetting resin; low cost; moderate chlorine resistance. Suggested uses: as an economical, low-cost, crease-resistant and/or wash-war finish for colored cotton goods. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Textile Div.

## RHOPLEX AC-200

(thermosetting acrylic ester emulsion)

Chemical properties: aqueous emulsion that converts on baking to hard, glossy, clear or pigmented films with exceptional water resistance. Suggested uses: industrial primers and top coats for metal to be applied from emulsion systems. Introduced as: significantly new grade. Availability: commercial quantities. Rohm & Haas Co., Resinous Products Div.

## RHOPLEX B-78

(modified acrylic copolymer emulsion)

pH (when packed), 8.7-9.0; Wt., 8.7 lbs./gal.; Colloidal Charge, anionic; Average Particle Size, 0.05 microns; Chemical properties: at room temperature, forms films that possess high gloss, a hardness equivalent to shellac, excellent water resistance, and easily dispersed with alkaline agents; solids —35% ±0.5%. Suggested uses: floor polishes, ingredients for floor seals, alkali strip coats for rubber products and metals, possible polymer base for floor paints and hard glossy paper coatings. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Resinous Products Div.

## RHOPLEX HA-4

Solubility: infinitely soluble in water. Chemical properties: 46% aqueous dispersion of acrylic copolymers; maximum softness and durability to washing and drycleaning. Suggested uses: pigment bonding, binder for nonwoven fabrics, backing for automotive and upholstery fabrics. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Textile Div.

## RHOPLEX T-123 (acrylic ester emulsion)

Chemical properties: emulsion to provide excellent flow and leveling properties in acrylic emulsion paints. Suggested uses: as a portion of the binder for interior paints on wall board, plaster, stucco, etc. Introduced as: significantly new grade. Availability: commercial quantities. Rohm & Haas Co., Resinous Products Div.

## ROVANA® (Saran micro-tape)

Chemical properties: exceptional covering power; high tear strength; tenacity when wet equal to or better than when dry; solution dyed; readily embossable; heat sealable; good recovery from folding, wrinkling. Suggested uses: filament tape for weaving and knitting into fabrics, alone or in combination with other fibers or filaments. Introduced as: new chemical product. Availability: commercial quantities. Dow Chemical Co., Textile Fibers Dept.

## SAL SODA CONCENTRATE (sodium carbonate monohydrate)

$\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$ . M.W., 124.02; Sp.G., 1.55 at 68 F; M.P., loses water at 109 C, melts at 851 C. Solubility: 50.5 gm. in 100 gm. water at 30 C; 47.5 gm. in 100 gm. water at 50 C. Chemical properties: positive heat of solution. Suggested uses: water softener; pH control of water; washing soda. Introduced as: product with new degree of availability. Availability: semicommercial quantities, commercial quantities. Diamond Alkali Co., Soda Products Div.

## SANTICIZER 409 (polymeric plasticizer)

Sp.G., 25/25 C, 1.081-1.084; Acidity, meq/100 g., 2.0 max.; Moisture (KF in methanol), 0.15% max.; Viscosity, 210 F, 115-130 cs. Chemical properties: resistance to extraction, volatilization, and migration; permanent. Suggested uses: films carrying adhesive backings; permanent, nonmigratory film, sheeting, coated

fabrics and extrusions; film for electrical tape; electrical compounds to meet UL105 C specs. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

## SANTOLUBE 602

Suggested uses: additive for automatic transmission fluids. Introduced as: new chemical product. Availability: laboratory quantities. Monsanto Chemical Co., Organic Div.

## SANTONOX (dialkyl phenol sulfide)

M.P., 145 C (min.). Solubility: at 25 C, gr./100 gr. solvent—acetone, 20; benzene, 5; methanol, 79; ethanol-2B, 47; water, 0.08. Chemical properties: FDA approved antioxidant; light gray or tan powder. Suggested uses: antioxidant for polyethylene. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

## SEBACIC ANILIDE (sebacic dianilide)

$\text{C}_{18}\text{H}_{34}\text{N}_2\text{O}_4$ . M.W., 352; M.P., 200-201 C; Solubility: insoluble in water, alcohol; slightly soluble in hot benzene; soluble in dimethylformamide. Suggested uses: rubber compounding. Introduced as: new chemical product. Availability: semicommercial quantities. City Chemical Corp.

## SILASTIC 52

Constituents: silicone gum, fillers, additives, vulcanizing agent. Sp.G., 1.15; Chemical properties: 50-durometer hardness; stays rubbery at temperatures far below zero to over 500 F; withstands weathering; resists ozone corona; handles easily, processes well. Suggested uses: molded, extruded and calendared rubber parts. Introduced as: new chemical product. Availability: commercial quantities. Dow Corning Corp.

## SILASTIC 82

Constituents: silicone gum, fillers, vulcanizing agent. Sp.G., 1.24; Chemical properties: 80-durometer hardness; stays rubbery at sub-Arctic temperatures or to elevated temperatures over 500 F; withstands weathering; resists ozone, corona; handles easily, processes well. Suggested uses: molded, extruded, and calendared rubber parts. Introduced as: new chemical product. Availability: commercial quantities. Dow Corning Corp.

## SILASTIC 1601

Constituents: silicone gum, filler and vulcanizing agent. Sp.G., 1.35; Chemical properties: excellent electrical properties even after long service at temperatures to 500 F; needs no milling before use. Suggested uses: especially developed for insulating electrical wire and cable; designed for use in insulation to meet UL standards SP and SFF. Introduced as: new chemical product. Availability: commercial quantities. Dow Corning Corp.

## SILASTIC 1602

Constituents: silicone gum, fillers, vulcanizing agent. Sp.G., 1.21; Chemical properties: easy handling; good retention of physical and electrical properties at service temperatures up to 500 F. Suggested uses: especially developed for use as insulation in high quality commercial, military, and naval wire and cable. Introduced as: new chemical product. Availability: commercial quantities. Dow Corning Corp.

## SILASTIC LS-422 BASE

Constituents: fluorocarbon silicone gum and filler. Sp.G., 1.38; Chemical properties: easy handling, pigmentable; rubbers from this base have good solvent resistance, are suitable for use from —80 F to 500 F. Suggested uses: suitable for making fluorocarbon silicone rubbers for seals, gaskets, and O-rings; such parts resist swelling by most fuels, oils, solvents, and are serviceable from —80 F to 500 F. Introduced as: new chemical product. Availability: commercial quantities. Dow Corning Corp.

## SILASTIC LS-63U

Constituents: fluorocarbon silicone gum, fillers, vulcanizing agent. Sp.G., 1.46; Solubility: in soluble in most commonly used fuels, oils, and solvents. Chemical properties: extrusion and calendaring grade fluorocarbon silicone rubber; resists swelling and retains good physical properties in contact with most common fuels, oils, and solvents; serviceable at sub-Arctic temperatures, elevated temperatures to 500 F. Suggested uses: seals, gaskets, O-rings, and other rubber goods that must withstand immersion in solvents, fuels and oils without swelling or deteriorating, and which must also remain serviceable at high or very low temperatures. Introduced as: new chemical product. Availability: commercial quantities. Dow Corning Corp.

## SILASTIC RTV 503

Constituents: silicone gum, fillers. Sp.G., 1.12; Chemical properties: room temperature vulcanizing silicone rubber; remains rubbery at temperatures from —100 F to 500 F; withstands long weathering with no appreciable changes in properties; is an excellent electrical insulator; resists corona, ozone, moisture; vulcanization can be accelerated with heat. Suggested uses: flexible mold material; manufacturing prototype rubber parts; caulking and sealing, potting and encapsulating. Introduced as: new chemical product. Availability: commercial quantities. Dow Corning Corp.

## SKYDROL 500A

Sp.G., 1.06 at 20 C; M.P., < —80 F. Solubility: soluble in most hydrocarbons. Chemical properties: formulated phosphate ester; low pour point; wide liquid range, high boiling, high viscosity index and excellent lubricant. Suggested uses: fire-resistant hydraulic fluid for aircraft. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

## SM 2010 EMULSION

Constituents: methyl phenyl silicone emulsion. Solubility: disperses easily in water to make stable dilute emulsion. Chemical properties: excellent release properties. Suggested uses: as release agent in extensible kraft paper manufacture. Introduced as: new chemical product. Availability: commercial quantities. General Electric Co., Silicone Products Dept.

## SM 2013 (dimethyl polysiloxane emulsion)

Solubility: dispersible in water in all portions. Suggested uses: paper coating to provide release from tacky materials for packaging and in process manufacturing. Introduced as: new chemical product. Availability: commercial quantities. General Electric Co., Silicone Products Dept., Chemical Div.

## SODIUM ACETYLIDE

$\text{NaC}_2\text{H}$ . Constituents: dispersion of 18 weight per cent sodium acetylide in xylene solvent. M.P., disproportionates at ca. 180 C to form sodium carbide and acetylene; Solubility: practically insoluble in most inert organic liquids. Chemical properties: reacts to introduce a triple bond to a variety of compounds; reacts with ketones, aldehydes, esters, amines, alkyl halides, epoxy compounds, and carbon dioxide. Suggested uses: for synthesis. Introduced as: significantly new grade, product with new degree of availability. Availability: semicommercial quantities. Air Reduction Chemical Co., Div. Air Reduction Co., Inc.

## SODIUM BOROHYDRIDE PELLETS

$\text{NaBH}_4$ . Sp.G., 5 lbs./gal.; #562, 10/32 in. diameter; #563, 24/32 in. diameter. Purity: 98%; Solubility: soluble in water. Chemical properties: eliminates dust problems. Suggested uses: sodium borohydride applications requiring pellet form; especially suited to fixed-bed applications. Introduced as: significantly new grade. Availability: commercial quantities. Metal Hydrides, Inc., Chemicals Div.

## SODIUM BOROHYDRIDE—STABILIZED WATER SOLUTION

$\text{NaBH}_4$  (S.W.S.). Constituents: sodium borohydride, sodium hydroxide and water. M.W., 38 ( $\text{NaBH}_4$ ); Sp.G., 1.4 g./cc.; 11.7 lbs./gal.; Purity: 12 ±0.5%; Chemical properties: a stable aqueous solution of low cost sodium borohydride. Suggested uses: textile processing, wood pulp bleaching, combating carbonyl and peroxide impurities in organic products, aldehyde and ketone reductions. Introduced as: significantly new grade. Availability: commercial quantities. Metal Hydrides, Inc., Chemicals Div.

## SODIUM HYDROXYACETATE (sodium glycolate)

$\text{CH}_2\text{OHCOONa}$ ; M.W., 98; M.P., 211-213 C; Moisture Max., 1.5%; Purity: 98.5% min.; Solubility: soluble in three parts cold, two parts hot water. Suggested uses: in electroless nickel plating; as a replacement for sodium acetate as a buffer in textile, dyestuff and leather manufacturing. Introduced as: significantly new grade. Availability: commercial quantities. Chemo Puro Mfg. Corp.

## SODIUM ZINC URANYL ACETATE

$\text{Na}_2\text{Zn}(\text{UO}_2)_2\text{C}_2\text{H}_3\text{O}_2 \cdot 9\text{H}_2\text{O}$ . M.W., 1592.13; Solubility: slightly soluble in water. Introduced as: new chemical product. Availability: laboratory quantities. City Chemical Corp.

## SODIUM ZIRCONIUM SILICO SULPHATE (sodium disulfatozirconate plus silica)

$\text{Na}_2\text{ZrO}(\text{SO}_4)_2 \cdot n\text{H}_2\text{O} + \text{SiO}_2$ . Constituents: the

mixture contains a minimum of 25.5% by weight of water-soluble zirconium oxide. Chemical properties: when extracted with water, it provides an unusually low cost zirconium salt solution. Suggested uses: preparation of precipitated zirconia-silica catalysts for petroleum cracking. Introduced as: new chemical product. Availability: commercial quantities. National Lead Co., Titanium Alloy Mfg. Div.

#### **SOLFAST RED B CP-1402 (B-O-N Red)**

Sp.G., 1.77; Purity: commercial. Solubility: very good resistance to bleed in water. Chemical properties: has all the desirable properties of the non-resinated B-O-N Reds and is sold at the resinated price; has exceptionally high strength, bronze print tone, excellent dispersion and good body and flow in inks. Suggested uses: primarily designed for printing inks but may find minor application in paints, rubber and plastics. Introduced as: new chemical product. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

#### **SOLUBLE BINDER #HAS23**

Constituents: pregelatinized modified starches, catalyst, plasticizer and preservative. 60 mesh granulation. Solubility: instantly soluble in cold water. Chemical properties: produces flexible, smooth, nonlumping, nongritty adhesive. Suggested uses: for use as an adhesive, mineral particle binder, coating color binder, cold water paint and kalsomate binder at 4 parts water to 1 part binder; can be dry blended with clays, pigments, etc., for joint compounds, crack fillers, spackling compounds, wall sizings, patching compounds, etc. Introduced as: new chemical product. Availability: commercial quantities. Morningstar-Paisley, Inc., Haberland Div.

#### **SPECIAL ALKALI BLUES CP-441, CP-473, CP-1094, CP-1095, CP-1098**

Sp.G., CP-441, 1.28; Purity: commercial. Chemical properties: Alkali Blue R CP-473 and G CP-441 were developed for rotogravure inks; they produce a very soft texture and develop good strength in rotogravure vehicles. Alkali Blue R CP-1095, G CP-1094 and Brilliant Alkali Blue R CP-1098 are compatible with all types of moisture set vehicles and are treated to give the ultimate in strength in this type vehicle. Suggested uses: specifically in rotogravure and moisture set inks. Introduced as: new chemical products. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color & Chemical Div.

#### **SPOTLEAK 1005**

Constituents: synthetic mercaptan-sulfide blend. M.W., 88.8 (av., calc.); Density, 0.93 at 20°C; B.P., 2% at 77°C; 98% at 133°C; Fr. Pt., < -50°C; Purity: 98% organic sulfur compounds. Chemical properties: excellent resistance to oxidation (fading); superior odor impact. Suggested uses: natural gas odorization. Introduced as: new chemical product. Availability: semicommercial quantities. Pennsalt Chemicals Corp., Industrial Chemicals Div.

#### **SPOTLEAK 1015**

Constituents: blend of synthetic aliphatic mercaptans. M.W., 85 (av.); Sp.G., 0.807 at 60/60°F; B.P., I.B.P. at 113°F; 98% at 158°F; Fr. Pt., < -50°F; Purity: 99% min.; Solubility: ca. 0.20% (by volume) in water; Av. Wt. Per Gal., 6.7 lb.; Reid Vapor Pressure, 8.0 psi. at 100°F. Chemical properties: resistance to oxidation (fading); water-white color; no turbidity or suspended matter. Suggested uses: natural gas odorization. Introduced as: new chemical product. Availability: commercial quantities. Pennsalt Chemicals Corp., Industrial Chemicals Div.

#### **SPVT, Na+ #ET-181**

(sulfonated polyvinyltoluene, sodium salt) M.W., 400,000; Sp.G., 0.35-0.5; M.P., decomposes above 300°C; Purity: 75% active polymer; Solubility: soluble in hot and cold water; soluble in glycerine, ethylene and propylene glycol. Chemical properties: stable in phosphoric acid or dilute sulfuric acid; polyelectrolyte (high electrical conductance in solution). Suggested uses: acid and base stable thickener; fluid loss control in drilling muds; improved corrosion resistance of phosphatized metal conversion coatings. Introduced as: new chemical product. Availability: semicommercial quantities (developmental). Laboratory quantities of high-molecular-weight sulfonated polyvinyltoluenes are also available. The Dow Chemical Co., Technical Service and Development Div.

#### **SR-220 SILICONE IMPREGNATING VARNISH**

Chemical properties: cures at low temperatures (150°C); high-temperature endurance superior to conventional silicone resins; excellent electrical properties; excellent shelf life and tank

stability; offers extended service life, high temperature resistance, extra overload capacity, smaller equipment size. Suggested uses: transformers and electronic equipment. Introduced as: significantly new grade. Availability: commercial quantities. General Electric Co., Silicone Products Dept.

#### **SS 4001 (dimethyl polysiloxane)**

Solubility: soluble in common aromatic hydrocarbons, chlorinated solvents and higher ketones. Suggested uses: paper coating to provide release from tacky materials for packaging and in process manufacturing. Introduced as: significantly new grade. Availability: commercial quantities. General Electric Co., Silicone Products Dept., Chemical Div.

#### **SS 4009 (dimethyl polysiloxane)**

Solubility: soluble in common aliphatic and aromatic hydrocarbons, chlorinated solvents and higher ketones. Suggested uses: paper coating to provide release from tacky materials for packaging and in process manufacturing. Introduced as: new chemical product. Availability: commercial quantities. General Electric Co., Silicone Products Dept., Chemical & Metallurgical Div.

#### **STACRYLIC RESIN EMULSIONS**

Constituents: copolymer emulsion containing ethyl acrylate as the major monomer. Sp.G., 1.05; Total Solids, 30%; Viscosity, low. Chemical properties: low foam tendencies; excellent shear and multivalent-ion stability; available both with and without freeze-thaw stability; films have good color stability and flexibility, and produce smooth coatings of high gloss. Suggested uses: in paper coatings to improve printability and to provide wet-rub and grease resistance. Introduced as: new chemical product. Availability: semicommercial quantities. A. E. Staley Mfg. Co., Industrial Sales Div.

#### **STEROX 21K**

Constituents: a modified surface active agent. Sp.G., 1.0580 at 30°C; Pour Pt., -6°C (ASTMD97-47). Solubility: miscible with water in all proportions; forms gel at concentrations of 25 to 70% in water. Chemical properties: stable in presence of acids and alkalis; permits shorter scouring and fulling time; eliminates need for a variety of additives; especially effective on multicolored fabrics. Suggested uses: acid fulling and agent for wool and woolen-synthetic blends. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Div.

#### **STRYCHNINE ARSENATE**

C<sub>2</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub>·H<sub>3</sub>AsO<sub>4</sub>·2H<sub>2</sub>O; M.W., 512; Soluble in water, more so in hot water. Introduced as: product with new degree of availability. Availability: laboratory quantities. City Chemical Corp.

#### **SULCHLOR 105**

Chemical properties: contains chemically active sulfur and chlorine together on the same molecule of the carrier, which is modified sperm whale oil. Suggested uses: active extreme-pressure, anti-weld and lubricity agent for ferrous metal grinding and cutting oils. Introduced as: new chemical product. Availability: commercial quantities. Carlisle Chemical Works.

#### **SULFAMIDE**

N<sub>2</sub>H<sub>4</sub>O<sub>2</sub>S; M.W., 96.1; M.P., 93°C; Purity: 95%+; Solubility: soluble in water, alcohols and acetone; insoluble in hydrocarbons. Chemical properties: reacts with aldehydes; formaldehyde can give resins; amines form substituted sulfamides; alcohols are dehydrated to ethers; forms metal salts; ammonio deliquescent; can be monochlorinated and mononitrated; isocyanates yield compounds of the type RNHCONHSO<sub>2</sub>NH<sub>2</sub>. Suggested uses: raw material for synthetic resins; chemical intermediate. Introduced as: new degree of availability. Availability: laboratory quantities. Allied Chemical Corp., General Chemical Div.

#### **SUL-FON-ATE BL EXTRA (aqueous solution of sodium salt of sulfonated aliphatic hydrocarbon)**

Solubility: soluble in caustic soda 0.25%; soluble in sulfuric acid 0.3%. Chemical properties: excellent surface activity in, stability to and solubility in concentrated solutions of strong electrolytes, e.g., 20-25% solutions of caustic soda; free of cresylic acid. Suggested uses: recommended as a wetting agent and penetrant for mercerizing cotton piece goods; as a detergent for use in alkaline boiling of cotton fabrics. Introduced as: new chemical product, product with new degree of availability. Availability: semicommercial quantities. Tennessee Corp., Marketing Research and Development Dept.

#### **α-SULFOPALMITIC ACID**

C<sub>16</sub>H<sub>31</sub>CH(SO<sub>3</sub>H)COOH; M.W., 340; Sp.G., 0.95; M.P., 29-31.2°C; Total Acid Value, 325-335; Sulfonic Acid Value, 160-170; Carboxyl Acid Value, 160-170. Purity: 98%; Solubility: — at 30°C in 100 ml. — water, 25 gm.; isopropanol, 100 gm.; ethylacetate, 125 gm.; Skellysolve B, 1 gm. Chemical properties: reacts readily to form mono salt, di salt, carboxyl ester. Suggested uses: flotation reagent, chemical intermediate, selective precipitant reagent, surface-active agent. Introduced as: new chemical product. Availability: semicommercial quantities. Armour Industrial Chemical Co.

#### **α-SULFOSTEARIC ACID**

C<sub>18</sub>H<sub>33</sub>CH(SO<sub>3</sub>H)COOH; M.W., 365; Sp.G., 0.95; M.P., 33.4-35°C; Total Acid Value, 305-315; Sulfonic Acid Value, 150-165; Carboxyl Acid Value, 144-155. Purity: 98%; Solubility: — at 30°C in 100 ml. — water, 13 gm.; isopropanol, 64 gm.; ethylacetate, 83 gm.; Skellysolve B, 1 gm. Chemical properties: reacts readily to form mono salt, di salt, and carboxyl ester. Suggested uses: flotation reagent, chemical intermediate, selective precipitant reagent, surface-active agent. Introduced as: new chemical product. Availability: semicommercial quantities. Armour Industrial Chemical Co.

#### **SULFUR TRIOXIDE-PYRIDINE COMPLEX**

SO<sub>2</sub>·C<sub>5</sub>H<sub>5</sub>N; M.W., 159.2; M.P., 145-55°C; Purity: 95%+; Solubility: generally insoluble in organic solvents; soluble in dimethylformamide; hydrolyzed by water. Chemical properties: reacts with alcohols or leuco vat dyes to give sulfates; olefinic alcohols (such as oleyl alcohol) can be sulfated without attack of the double bond; amines form sulfamates; sulfonates alkanolamines (such as butadiene) and acid-sensitive heterocyclic compounds (furan, pyrrole, thiophene, indole, etc.). Suggested uses: specialty sulfating and sulfonating agent. Introduced as: new chemical product. Availability: laboratory quantities. Allied Chemical Corp., General Chemical Div.

#### **SUMSTAR (dialdehyde starch)**

(C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>)<sub>x</sub>; M.W., (160)<sub>x</sub>; M.P., decomposes above 200°C; Purity: <1% to 95%+ dialdehyde; Solubility: 5% in water at 50°C; insoluble in most organic solvents. Chemical properties: free-flowing powder resembling starch in physical properties; a polymeric dialdehyde that will cross link with hydroxyl groups and insolubilize proteins. Suggested uses: wet strength in paper; finishing agent in textiles; tanning agent for leather; hardening agent for gelatin; insolubilizer for PVA; phenol-aldehyde type resins; protective coatings; adhesives; and binders. Introduced as: new chemical product. Availability: semicommercial quantities. Miles Chemical Co., Div. Miles Laboratories, Inc.

#### **SUPERFLOC 16 FLOCCULANT (polyacrylamide)**

Constituents: high molecular weight polyacrylamide. M.W., several million. Purity: high-grade; Solubility: soluble in water. Chemical properties: granular powder; low monomer content. Suggested uses: flocculant in highly acid, neutral and alkaline suspensions of mineral fines, chemical precipitates, industrial wastes, sewage, etc. Introduced as: significantly new grade. Availability: commercial quantities. American Cyanamid Co., Organic Chemicals Div.

#### **SYNAT (amide of potato starch)**

Chemical properties: reactive with thermosetting resins; excellent clarity and stability of cooked solutions; strong adhesion to many hydrophobic surfaces. Suggested uses: textile finishes; warp sizing. Introduced as: new chemical product. Availability: commercial quantities. Morningstar-Paisley, Inc., Textile Div.

#### **TAMOL 850 (aqueous dispersant solution)**

Sp.G., 9.9 lbs./gal.; Fr. Pt., 0 to -10°C; Viscosity (Brookfield), 200-400 cps. at 25°C. Solubility: soluble in polar solvents such as water, glycerine, and ethylene glycol. Chemical properties: very low foaming, light colored dispersant with excellent dispersing activity; 30 ± .5% solids. Suggested uses: dispersing inorganic pigments and clays in aqueous systems. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Resinous Products Div. and Textile Div.

#### **TAMOL C**

Chemical properties: neutral type phenolic syntan of outstanding filling and lightfastness. Suggested uses: producing white leather. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Leather Chemicals Div.

#### **TENDERFIL (processed starch)**

Constituents: modified tapioca. Purity: meets

# 437 NEW CHEMICALS

## FOR INDUSTRY

NCA specs.; Solubility: dispersible in 180 F aqueous solutions. Chemical properties: thickener and stabilizer with exceptional organoleptic and stability properties; can withstand high temperatures in pressure retort conditions even under acid pH. Suggested uses: canned foods, processed baby foods, high acid containing foods. Introduced as: significantly new grade. Availability: commercial quantities. Morningstar-Paisley, Inc., Food Products Div.

### TENN-ACID® 855 (modified alkyl aryl sulfonic acid)

Solubility: organic and inorganic salts are soluble in low to moderate concentrations of caustic soda, i.e., 1-8% NaOH. Chemical properties: inorganic salts are compatible with high concentrations of inorganic builders; salts are effective in acid and alkali. Suggested uses: detergent for use in alkaline boiling of cotton fiber or fabrics; base detergent acid for preparing inorganic or organic salts singularly or in combination with various organic solvents. Introduced as: new chemical product. Availability: commercial quantities. Tennessee Corp., Marketing Research and Development Dept.

### TEREPHTHALALDEHYDE

$C_8H_6O_2$ . M.W., 134.12; M.P., 114 C; B.P., 248 C at 760 mm. Hg; 151-154 C at 15-16 mm. Hg. Purity: 98+%; Solubility: at 25 C, acetone, 15%; benzene, 6%; dioxane, 14%; cyclohexanone, 4%; insoluble in water and chlorinated solvents. Chemical properties: white crystalline solid. Suggested uses: pharmaceuticals, dyes, organic intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Diamond Alkali Co., Research Dept., Product Development.

### TERGITOL® NONIONIC E-35

Sp.G., 1.031 at 20/20 C. Chemical properties: light yellow liquid; stable when spray-dried on highly alkaline materials such as flake caustic or sodium meta-silicate. Suggested uses: detergent for bottle washing, metal cleaning, and automatic dishwashing applications. Introduced as: new chemical product. Availability: semicommercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

### TERGITOL® NONIONIC E-68

Sp.G., 1.043 at 33/15.6 C; Appearance at 25 C, white semisolid. Suggested uses: detergent for bottle washing, metal cleaning, and automatic dishwashing applications in highly caustic systems used at elevated temperatures. Introduced as: new chemical product. Availability: semicommercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

### TETRABROMO DIPHENOLIC ACID (4,4-bis(3,5-dibromo-4-hydroxyphenyl)- pentanoic acid)

$CH_3C(HO C_6H_3Br_2)_2CH_2CH_2COOH$ ; M.W., 522 theoretical; M.P., 101-114 C; Neut. Eq., 204.7. Chemical properties: appearance—light tan powder. Suggested uses: chemical intermediate for possible cidal active uses or fire-retardant applications. Introduced as: new chemical product. Availability: laboratory quantities. S. C. Johnson & Son, Inc., Service Products Div.

### TETRACHLOROBISPHENOL A (2,2'-bis(3,5-dichloro-4-hydroxyphenyl)- propane)

$C_{15}H_{12}O_2Cl_4$ . M.W., 366.08; M.P., 135-136 C. Purity: high. Suggested uses: flame-retardant raw material for epoxy resins, polyesters, and polycarbonates. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Div.

### TETRACHLORO DIPHENOLIC ACID (4,4-bis(3,5-dichloro-4-hydroxyphenyl)- pentanoic acid)

$CH_3C(HO C_6H_3Cl_2)_2CH_2CH_2COOH$ ; M.W., 424 theoretical; M.P., 181-185 C; Neut. Eq., 142. Chemical properties: appearance—light tan powder. Suggested uses: chemical intermediate for possible cidal active uses or fire-retardant applications. Introduced as: new chemical product. Availability: laboratory quantities. S. C. Johnson & Son, Inc., Service Products Div.

### TETRACHLOROTHIOPHENE

$C_4Cl_4S$ ; M.W., 221.93; Sp.G.,  $D_{40}^{20}$ , 1.7036;

M.P., 29-30 C; B.P., 104 C/10 mm.; 159 C/100 mm.; R.I.,  $n_D^{20}$ , 1.5915; Purity: >95%. Solubility: insoluble in water, soluble in aromatic and aliphatic hydrocarbons, chlorocarbons and in the lower alcohols. Chemical properties: water white with odor resembling aromatic chlorocarbons. Suggested uses: chemical intermediate; potential interest in agricultural and pesticidal fields. Introduced as: product with new degree of availability. Availability: more significant laboratory quantities. Hooker Chemical Corp., Product Development.

### $\alpha,\alpha'$ -2,3,5,6-TETRACHLORO-p-XYLENE DIOL

$C_8H_2Cl_4O_2$ . M.W., 275.97; M.P., 229-230 C. Purity: 95+%; Solubility: insoluble in all common solvents. Chemical properties: white crystalline solid. Suggested uses: flame-retardant polyesters; organic intermediate. Introduced as: new chemical product. Availability: laboratory quantities. Diamond Alkali Co., Research Dept., Product Development.

### 2,2,4,4-TETRAMETHYL-1,3-CYCLO- BUTANEDIOL

$C_8H_{18}O_2$ . Constituents: 50/50 mixture of the cis and trans isomers of this compound. M.W., 144.2; M.P., 125-135 C; B.P., approx. 210-215 C; Flash Pt. (Cleveland Open Cup), 125-135 C. Solubility: soluble to some extent in isopropyl acetate, water, methanol, and toluene; requires heat in some cases. Chemical properties: undergoes typical reactions of a secondary glycol. Suggested uses: chemical intermediate; among its derivatives are the diesters, which have shown exceptional thermal and hydrolytic stability in preliminary studies. Introduced as: new chemical product. Availability: laboratory quantities. Eastman Chemical Products, Inc., Chemicals Div.

### TETRAMETHYL-1,3-CYCLOBUTANEDIONE

$C_6H_{12}O_2$ . M.W., 140.2; M.P., 115-116 C (with sublimation); B.P., 159 C; Vapor Pressure, 38 mm. at 87 C, 6 mm. at 52 C. Solubility: soluble to some extent in ethanol, isopropyl acetate, benzene, acetic acid and xylene; solubility increases with heat. Chemical properties: reacts with the usual carbonyl group reagents and in some cases, the reaction proceeds further to produce heterocyclic derivatives. Suggested uses: the diketone itself is important mainly as a chemical intermediate; the heterocyclic compounds have potential applications in photographic field and as dye intermediates. Introduced as: new chemical product. Availability: laboratory quantities. Eastman Chemical Products, Inc., Chemicals Div.

### THURICIDE

(experimental microbial insecticide)

Constituents: live spores of the micro organism *Bacillus thuringiensis* on a varied insect carrier. Chemical properties: harmless to man, other warm blooded animals, fish and plants and creates no residue problem; specific for certain insects and does not affect bees, insect parasites and predators; there is reasonable assurance that susceptible insects will not develop resistance to the killing action. Suggested uses: as an insecticide—applied to plant foliage in such a way that viable spores will be ingested by the insect that is to be controlled. Introduced as: new chemical product. Availability: laboratory quantities. Stauffer Chemical Co., Agricultural Chemical Div., with Bioform Corp.

### TITANIUM TRICHLORIDE

$TiCl_3$ ; Formula Wt., 154.27; Sp.G., 2.6; B.P., decomposes at 440 C. Purity: >97%; Solubility: soluble in acetonitrile, certain amines, low molecular weight alcohols to form solvated complexes. Chemical properties: violet, anhydrous, deliquescent crystals; decomposes in presence of oxygen in liquid and gas phases; oxidation potential  $-1.5V$ . Suggested uses: co-catalyst for polyolefin polymerization, reducing agent catalyst for organic reactions, and source of titanium for organometallic synthesis. Introduced as: product with new degree of availability. Availability: commercial quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

### TITANIUM TRICHLORIDE—HR, HRA, AR, ARA

$TiCl_3$ ; Purity ( $TiCl_3$ ): HR, HRA = 98.5-99.9%; AR, ARA = 74.0-78%. Solubility: soluble in acidic aqueous solutions, oxygenated organic solvents (e.g., alcohols, ketones, dimethylformamide through formation of addition compounds); insoluble in ethers,  $CS_2$ ,  $TiCl_4$ ,  $CH_2Cl_2$ ,  $CCl_4$  and hydrocarbons. Chemical properties: light purple powder available in four different grades. Suggested uses: polyolefin catalyst. Introduced as: significantly new grade. Availability: semicommercial quantities. Stauffer Chemical Co., Anderson Chemical Co. Div.

### TOLAD 199

Chemical properties: inhibitor-type additive characterized by maximum reduction of insoluble residue, excellent water tolerance and enhanced color stability for heating fuels. Suggested uses: stability additive for No. 2 fuel oil and Diesel fuel. Introduced as: new product. Availability: commercial quantities. Petrolite Corp., Tretolite Co. Div.

### TOLAD 199-D

Chemical properties: inhibitor-dispersant type additive characterized by its ability to reduce insoluble residue and to promote dispersion of any such residue formed in Diesel fuels. Suggested uses: stability additive for No. 2 fuel oil and Diesel fuel. Introduced as: new chemical product. Availability: commercial quantities. Petrolite Corp., Tretolite Co. Div.

### TPSA (tetrapropenylsuccinic anhydride) (dodecenylnsuccinic anhydride)

$C_{16}H_{32}O_5$ . M.W., 266; Sp.G., 1.0045 at 25/25 C; B.P., 150 C at 3 mm. Hg. Purity: 99-101%; Solubility: soluble in acetone, benzene, petroleum ether; insoluble in water. Chemical properties: reactive C-C bond; anhydride structure; forms esters, salts, imides, amides, etc. Suggested uses: epoxy resin curing agent; intermediate for greases; corrosion inhibitors; lubricants; surfactants, etc. Introduced as: product with new degree of availability. Availability: commercial quantities. Monsanto Chemical Co., Organic Div.

### TRIALLYL PHOSPHATE

Soluble in hexane, benzene, acetone and ethanol. Chemical properties: homo-polymerizes, co-polymerizes, adds halogens to double bonds. Suggested uses: derivatives may be useful in extractions of metallic ions. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Hooker Chemical Corp., Product Development.

### TRIETHYLALUMINUM (TEAL)

$(C_2H_5)_3Al$ ; M.W., 114.1; Sp.G., 0.837; M.P., -52.5 C; B.P., 194 C at 760 mm.; Purity: 90% min., impurities are unchanged triisobutylaluminum and diisobutylaluminum hydride—minimum active content, 95%. Solubility: miscible with saturated hydrocarbons. Chemical properties: stability—air, ignites on exposure to air (pyrophoric); water, reacts violently with hydrocarbon gas liberation; heat, stable at temperatures less than 71 C. Suggested uses: catalyst intermediate for polymerization of olefins; pyrophoric fuels; chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. Anderson Chemical Co., Div. of Stauffer Chemical Co. for Texas Alkyls, Inc.

### TRISOBUTYL ALUMINUM

$(i-C_4H_9)_3Al$ ; Formula Wt., 198.328; Fr. Pt., 10 C; B.P., 113.8 C at 30 mm. Hg; Vapor Pressure, mm. Hg., 0.95 at 50 C; Density at 20 C, 0.7876 gm./ml. Chemical properties: clear colorless liquid at 25 C; reacts violently with water; fumes violently with air. Suggested uses: catalyst for polymerization of olefins; chemical intermediate. Introduced as: new chemical product. Availability: commercial quantities. Ethyl Corp.

### TRISOBUTYLALUMINUM (TIBAL)

$(C_4H_9)_3Al$ ; M.W., 198.3; Chemical properties: stability—air, ignites on exposure to air (pyrophoric); water, reacts violently with hydrocarbon gas liberation; heat, stable at temperatures less than 71 C. Suggested uses: catalyst intermediate for polymerization of olefins; chemical intermediate; gas plating of aluminum. Introduced as: new chemical product. Availability: commercial quantities. Anderson Chemical Co., Div. of Stauffer Chemical Co. for Texas Alkyls, Inc.

### TRIMELLITIC ANHYDRIDE (1,2,4-benzene tricarboxylic acid- 1,2-anhydride)

M.W., 192.12; Suggested uses: protective coatings, polyesters, dyes, pigments, plasticizers, resins, epoxy curing, printing inks. Introduced as: product with new degree of availability. Availability: pilot-plant quantities. Amoco Chemicals Corp., Development Dept.

### TRIMETHYLOLPROPANE MONOOLEATE

$C_2H_5C(CH_3)(CH_2OH)_2CH_2OOC C_{17}H_{33}$  (theoretical); Constituents: product contains amounts of mono, di and tri esters and free polyol and approximately 1% free oleic acid. M.W., 398; Sp.G., 0.954 at 25 C; Fr. Pt., less than -20 C; Solubility: insoluble in water; soluble in most organic solvents. Chemical properties: oily liq.



uid; low freezing point (useful at low temperatures); the quaternary beta carbon in the polyol portion provides good thermal stability at high temperatures. Suggested uses: water in oil emulsifier; corrosion inhibitor for oil systems; low temperature plasticizer; de-icing agent for gasoline. Introduced as: new chemical product. Availability: commercial quantities. Kessler Chemical Co., Inc.

#### TRIMETHYLOLPROPANE MONOSTEARATE

$C_{2}H_5 C(CH_2OH)_2CH_2OOC(C_{17}H_{35})$  (theoretical); Constituents: product contains amounts of mono, di and tri esters and free polyol and approximately 1% free stearic acid. M.W., 400; M.P., 32.6°C; Iodine Value, less than 0.5. Solubility: insoluble in water; soluble in most organic solvents. Chemical properties: waxy solid; melting point is slightly below body temperature; the quaternary beta carbon in the polyol portion and high degree of saturation of this product provide excellent thermal stability at high temperature. Suggested uses: emulsifier; opacifier and thickener for creams and lotions. Introduced as: new chemical product. Availability: commercial quantities. Kessler Chemical Co., Inc.

#### 2,2,4-TRIMETHYLPENTANOL

Properties: the absence of  $\beta$ -hydrogen atoms results in esters exhibiting good heat stability. Suggested uses: synthetic high-temperature lube bases, functional fluids and terminating agent for polyesters; several of the esters have shown promise for use as plasticizers. Introduced as: new chemical product. Availability: laboratory quantities. Eastman Chemical Products, Inc., Chemicals Div.

#### TRIOSUL (LIQUID $SO_2$ STABILIZED)

Properties: the stabilizing agent in Triosul prevents the polymerizing effect of water that renders unstable  $SO_2$  unusable; also allows simplified cleaning of the vaporizer. Suggested uses: primarily as a sulfonating or sulfolating agent in the production of detergents, petroleum sulfonates, drug intermediates and other organic chemicals. Introduced as: new chemical product. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Div.

#### "TRISEC" D (modified trichlorethylene)

Patented by Imperial Chemical Industries, Ltd. Suggested uses: a solvent for drying (free from spotting) water wet metal or any parts unaffected by trichlorethylene. Introduced as: significantly new grade. Availability: commercial quantities. Chemical Mfg. Co., Inc.

#### TRITON QS-15

Constituents: oxyethylated sodium salt containing both anionic and cationic centers. Sp.G., 1.12; Setting Pt.,  $<-10^\circ C$ ; pH (1% sol.), 10.2. Purity: 100% active. Solubility: soluble in all proportions in water, alcohols, aromatic solvents, chlorinated solvents, cellosolves, glycol ethers and ketone; insoluble in aliphatic solvents. Chemical properties: amphoteric, chemically stable in aqueous solutions of strong alkali. Suggested uses: surfactant ingredient in highly alkaline built cleaners where maximum detergency is required. Introduced as: new chemical product. Availability: commercial quantities. Rohm & Haas Co., Agricultural & Sanitary Chemicals.

#### TUNGSTEN DICHLORIDE

$WCl_2$ ; Formula Wt., 254.77; M.P., unstable; Sp.G., 5.436; Purity:  $>99\%$ . Chemical properties: gray powder; reacts with water to decompose it and liberate hydrogen. Suggested uses: metal coating; intermediate in synthesis of metal chemicals; catalyst for olefin polymerization. Introduced as: new chemical product. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

#### TUNGSTEN HEXACHLORIDE

$WCl_6$ ; Formula Wt., 396.6; M.P., 275°C; Sp.G., 3.5; B.P., 346.7°C; Purity: 96%+. Solubility: soluble in non-polar solvents as benzene and carbon disulfide. Chemical properties: dark blue cubic crystals; decomposes in water. Suggested uses: catalyst for polymerization of higher olefins; chemical intermediate for lower valence state preparations; source of tungsten for organometallic synthesis. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co.

#### TWITCHELL 7440 LUBRICANT

Chemical properties: fatty-based; excellent anti-static properties and lubricity; high scourability and solubility; good resistance to yellowing. Suggested uses: anti-static lubricant for processing natural and synthetic fibers. Introduced as: new chemical product. Availability: commercial quantities. Emery Industries, Inc., Organic Chemical Sales Dept.

#### UCAR® BUTYLENE OXIDE 12

##### (1,2-butylene oxide)

M.W., 72.11; Sp.G., 0.8312 at 20/20°C; M.P., sets to a glass below  $-150^\circ C$ ; B.P., 63.2°C at 760 mm.;  $-0.7^\circ C$  at 50 mm.;  $-27.0^\circ C$  at 10 mm. Purity: 97.5%; Solubility: in water at 20°C, 5.91% wt.; water in, 2.65% wt.; miscible in all proportions at 25°C with acetone, benzene, ethyl ether, heptane, methanol, carbon tetrachloride. Chemical properties: undergoes usual reactions of epoxides including those with water, alcohols, thiols, ammonia, amines and acids. Suggested uses: acid-accepting stabilizer for chlorinated solvents, chlorinated paraffins, chlorinated rubber and vinyl chloride polymer and copolymer resins; modifier and chemical intermediate for polyether-type polymers, detergents, wetting agents, corrosion inhibitors, emulsifiers, demulsifiers, lubricants, oil additives, textile chemicals, etc. Introduced as: significantly new grade. Availability: commercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### UCAR® TRIPHENOL P

##### (1,1,3-tris(hydroxyphenyl)propane)

$(HO-C_6H_4)_3C_3H_5$  (C<sub>18</sub>H<sub>19</sub>O<sub>3</sub>); M.W., 320.37; Sp.G., 25/20°C, 1.226; Glasspoint, sets to glass in range of 90 to 110°C; Solubility: in water at 25°C, 0.05% by weight. Chemical properties: a mixture of isomers of 1,1,3-tris(hydroxyphenyl)propane; the isomers differ in the positions of the hydroxyl groups on the benzene rings, some being *ortho* and others *para* to the point of attachment to the propane structure. Suggested uses: chemical intermediate. Introduced as: new chemical product. Availability: semicommercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### UNIVADINE W

Solubility: nonionic liquid that may be diluted with water in any proportion. Chemical properties: unique leveling action allowing for good dyeing results even in barren and damaged wool. Suggested uses: wool dyeing, also for shading of acid milling, premetallized and chrome dyestuffs. Introduced as: new chemical product. Availability: commercial quantities. Ciba Co., Inc., Chemical Specialties Div.

#### UNOX® EPOXIDE 201

##### (3,4-epoxy-6-methylcyclohexylmethyl-

##### 3,4-epoxy-6-methylcyclohexane carboxylate)

$C_{12}H_{20}O_4$ ; M.W., 280.35; Sp.G., 1.121 at 20/20°C; B.P., 215°C (5 mm.); Pour Pt., 30°F; Visc., 1810 cps. at 25°C; R.I. (nd), 1.4920 at 20°C; Solubility: soluble in water, 0.3% by wt. at 20°C; solubility of water in, 1.8% by wt. at 20°C. Chemical properties: in comparison with bisphenol-glycidyl ether resins, it has lower viscosity, better color and color stability, and higher reactivity in acid and anhydride systems; the resulting resins feature high heat-distortion temperatures; anhydride reactivity and ultimate resin properties of anhydride systems are generally improved by the addition of a polyol initiator; reactivity with polyamine hardeners is much slower, so that longer pot lives are expected; its reactivity suggests evaluation as a cross-linker and an acid-number reducer. Suggested uses: an epoxy resin monomer; a stabilizer for vinyl chloride resins. Introduced as: product with new degree of availability. Availability: commercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### UNOX® EPOXIDE 206

##### (vinylcyclohexane dioxide)

$O(C_6H_9)[CHCH_2O]$ ; M.W., 140.18; Sp.G., 1.0986 at 20/20°C; Fr. Pt., sets to glass below  $-55^\circ C$ ; B.P., at 760 mm. Hg, 227°C; Vapor Pressure, at 20°C, 0.1 mm. Hg; Viscosity, at 20°C, 7.77 cps.; Solubility: in water at 20°C, 18.3% by wt.; of water in, at 20°C, 9.5% by wt.; R.I. (nd) at 20°C, 1.4787. Chemical properties: the epoxycyclohexane group is reactive under acidic conditions whereas the epoxyethyl group is reactive under basic conditions; hydrogenation yields the cycloaliphatic diol and hydrolysis yields the tetrol. Suggested uses: as a reactive diluent for Carbide's diepoxides and bisphenol-A epichlorohydrin derived epoxy resins; chemical intermediate that can be polymerized alone to a three-dimensional resin and also can form condensation resins with dicarboxylic acids; as a monomer for preparation of polyglycols containing unreacted epoxy groups. Introduced as: new chemical product. Availability: semicommercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### UNOX® EPOXIDE 207

##### (dicyclopentadiene dioxide)

$C_{10}H_{12}O$ ; M.W., 164.21; Density, 1.331 g./ml. at 25°C; M.P., 184°C; Solubilities at 25°C, in water, 1.4% by wt.; in acetone, 44.7% by wt.; in benzene, 48.4% by wt.; ethyl ether, 18.7%

by wt.; heptane, 1.7% by wt.; in methanol, 18.6% by wt.; in carbon tetrachloride, 23.1% by wt. Chemical properties: a white crystalline powder; epoxy groups are most reactive under acidic conditions; can be hydrolyzed under acidic conditions to a tetrol; forms dibalohydrins with HCl and HBr or hydroxy esters with organic acids; in the presence of both HBr and organic acids, bromohydrin forms preferentially on the five-membered ring and hydroxy ester on the six-membered ring. Suggested uses: chemical intermediate for resins, plasticizers, and protective coatings; epoxy resins with heat distortion temperatures in the 300°C range can be made from dicyclopentadiene dioxide, anhydride hardeners, and polyol initiators—these high-heat-distortion-point resins are suggested for evaluation in grinding wheels, brake linings, and dry lay-up laminates. Introduced as: product with new degree of availability. Availability: commercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### UNOX® EPOXIDE 269

##### (dipentene dioxide) (limonene dioxide)

$C_{10}H_{16}O_2$ ; M.W., 168.23; Sp.G., 1.0326 at 20/20°C; B.P., 242°C (760 mm.), 148°C (50 mm.), 110°C (10 mm.); V.P., 0.02 mm. at 20°C; Fr. Pt., sets to glass below  $-100^\circ C$ ; Visc., 8.4 cps. at 20°C; R.I. (nd), 1.4682 at 20°C; Solubility in water, 3.24% by wt. at 20°C; solubility of water in, 3.17% by wt. at 20°C. Chemical properties: colorless liquid; both epoxy groups are highly acid reactive, the ring epoxide has the greater acid reactivity; can be hydrolyzed under acidic conditions to the tetrol, erythritol; forms dibalohydrins with HCl and HBr or hydroxy esters with organic acids. Suggested uses: for cross-linking polymers containing active hydrogens such as acrylic acid; as a scavenger for trace quantities of free acids and Cl in polymer solutions and oils; for evaluation as an epoxy resin reactive diluent and extender; chemical intermediate for plasticizers, cyclic glycols, alkanolamines, pharmaceuticals, and odorants. Introduced as: product with new degree of availability. Availability: semi-commercial quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

#### UV 314 EXPERIMENTAL ULTRAVIOLET ABSORBER

##### (2,2'-dihydroxy-4-n-octoxy benzophenone)

Chemical properties: compound selectively absorbs ultraviolet radiation that degrades plastics, paints, pigments, textiles, paper and wood. Suggested uses: see above. Introduced as: new chemical product. Availability: semicommercial quantities. American Cyanamid Co., Organic Chemicals Div.

#### UVITEX ERN CONC.

Solubility: insoluble in water. Chemical properties: dispersion of extremely fine particle size; nonionic optical brightener possessing outstanding light fastness; may be applied by exhaust or padding with subsequent heat curing; produces strong whites of slightly reddish cast with outstanding fastness properties; excellent light fastness. Suggested uses: recommended for polyester, acetate, triacetate, and polyamide fabrics as their cotton blends. Introduced as: new chemical product. Availability: commercial quantities. Ciba Co., Inc., Chemical Specialties.

#### VANADIUM ACETYLACETONATE

$V(C_5H_7O_2)_3$ ; M.W., 350; M.P., 182.5°C; Solubility: soluble in common organic solvents, such as chloroform and benzene; low solubility in water. Chemical properties: brown crystalline solid; can be easily oxidized to  $VO(C_5H_7O_2)_3$ ; organic soluble, good means of introducing metal into organics. Suggested uses: same as ferric acetylacetonate, q.v. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

#### VANADIUM OXYTRICHLORIDE

##### (vanadyl chloride)

$VOCl_3$ ; M.W., 173.32; Density, 1.811; B.P., 126.7°C; Purity: 28.81% vanadium; Solubility: soluble in inert hydrocarbons. Chemical properties: reacts with water to give a red colored solid; reacts explosively with alkali metals. Suggested uses: as a catalyst for polymerization. Introduced as: product with new degree of availability. Availability: semicommercial quantities. Anderson Chemical Co., Div. Stauffer.

#### VANADIUM OXYTRICHLORIDE

##### (vanadyl trichloride; vanadyl chloride)

$VOCl_3$ ; Formula Wt., 173.32; M.P.,  $-77 \pm 2^\circ C$ ; Sp.G., 1.83 at 25°C; B.P., 126.7°C; Purity:  $>99\%$ ; Solubility: soluble in cold water, alcohol, ether, and acetic acid. Chemical properties: lemon-yellow deliquescent liquid; unstable

# CHEMICAL WEEK • ADVERTISERS' INDEX

January 30, 1960

*ALLIED CHEMICAL CORP., NATIONAL ANILINE DIV.	40
Agency—James J. McMahon, Inc.	
*ALLIED CHEMICAL CORP., NITROGEN DIV.	56
Agency—G. M. Basford Co.	
AMERICAN AIR LIQUIDE, INC.	14
Agency—Stanfield, Johnson & Hill, Ltd.	
ARAPAHOE CHEMICALS, INC.	64
Agency—The Schuyler Hopper Co.	
ARIZONA CHEMICAL CO. SUB. OF AMERICAN CYANAMID CO.	60
Agency—Erwin Wasey, Ruthrauff & Ryan, Inc.	
*ARMOUR INDUSTRIAL CHEMICAL CO.	18-19
Agency—Foster, Cone & Belding	
ARMOUR PHARMACEUTICAL CO.	50
Agency—Jordan-Sieber & Corbett, Inc.	
ATLANTIC COAST LINE RAILROAD	44
Agency—Tucker Wayne & Co.	
BLOCKSON CHEMICAL CO.	20
Agency—Wm. Balsam Adv.	
*BRYTON CHEMICAL CO.	69
Agency—Benton & Bowles, Inc.	
BZURA CHEMICAL CO., INC.	33
Agency—Ray Ellis Adv. Inc.	
CABOT INC., GODFREY L.	3rd cover
Agency—Larom Randall Adv., Inc.	
CENTURY CHEMICAL CORP.	17
Agency—G. M. Basford Co.	
CHURCH & DWIGHT CO., INC.	50
Agency—Charles W. Hoyt Co. Inc.	
COLUMBIAN CARBON CO.	54
Agency—Donahue & Coe Inc.	
*COMMERCIAL SOLVENTS CORP.	21
Agency—Fuller & Smith & Ross Inc.	
DAY CO., THE J. H.	12
Agency—The Keeler & Stites Co.	
*EASTMAN CHEMICAL PRODUCTS CO.	39
Agency—Fred Wiltner Co.	
EMERY INDUSTRIES INC.	62
Agency—Farnon, Huff & Northlieh, Inc.	
*ENJAY CO., INC.	83
Agency—McCann-Erickson, Inc.	
FRONTIER CHEMICAL CO.	51
Agency—The McCormick-Armstrong Co.	
FRUEHAUF TRAILER CO.	10
Agency—The Allman Co., Inc.	
GENERAL AMERICAN TRANSPORTATION CORP.	32
Agency—Edward H. Weiss & Co.	
GOODRICH CHEMICAL CO. B. F.	25
Agency—The Griswold-Eshleman Co.	
GOODYEAR TIRE & RUBBER CO.	1
Agency—Kulmer Adv. Agency	
GROSS & CO., INC., A.	36
Agency—G. M. Basford Co.	
HERCULES POWDER CO.	80
Agency—Fuller & Smith & Ross, Inc.	
*HOOKER CHEMICAL CORP.	59-77
Agency—The Rumrill Co., Inc.	
JOHNS-MANVILLE CORP.	8
Agency—Cunningham & Walsh Inc.	
*KRAFT BAG CO.	63
Agency—Arthur A. Judson, Inc.	
*METAL & THERMIT CORP.	13
Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.	
MICHIGAN CHEMICAL CORP.	74
Agency—Aves, Shaw & Ring, Inc.	
*MILES CHEMICAL CO.	9
Agency—Klau-Van Pieterse-Dunlap, Inc.	
*MINERALS & CHEMICALS CORP. OF AMERICA	6-7
Agency—Richardson, Thomas & Bushman, Inc.	
NATIONAL LEAD CO.	73
Agency—Marshchalk & Pratt Co., Inc.	
NEVILLE CHEMICAL CO.	78
Agency—Bond & Starr, Inc.	
PENICK CO., S. B.	43
Agency—James J. McMahon Adv.	
PENNSYLVANIA REFINING CO.	57
Agency—Downing Industrial Adv., Inc.	
REILLY TAR & CHEMICAL CORP.	65
Agency—The House of J. Hayden Twiss	
RHODIA, INC.	48
Agency—Sudler & Hennessey, Inc.	
ROHM & HAAS CO.	2
Agency—Arndt, Preston, Chapin, Lamb & Keen, Inc.	
ROUSSEL CORP.	64
Schneider-Stogel Co. Adv.	
SHELL CHEMICAL CORP.	22
Agency—J. Walter Thompson Co.	
SPECIALTY MACHINERY CORP.	42
Agency—Lewis Studios	
STANDARD OIL CO. (INDIANA)	45
Agency—D'Arcy Advertising Co.	

STANDARD STEEL CORP.	64
Agency—The McCarty Co.	
*STAUFFER CHEMICAL CO.	11
Agency—John Mather Lupton Co.	
SWIFT & CO.	15
Agency—Russell T. Gray, Inc.	
TIDEWATER VIRGINIA DEVELOPMENT COUNCIL	58
Agency—McCurry, Henderson, Enright, Inc. Adv.	
TITANIUM PIGMENT CORP. SUB. OF NATIONAL LEAD CO.	4th cover
Agency—Doyle Kitchen & McCormick Inc.	
UNION CARBIDE CHEMICALS CO. DIV. OF UNION CARBIDE CORP.	49
Agency—J. M. Mathies Inc.	
UNION CARBIDE PLASTICS CO., DIV. OF UNION CARBIDE CORP.	4-5
Agency—J. M. Mathies, Inc.	
U. S. RUBBER CO., MECHANICAL GOODS DIV.	70
Agency—Fletcher, Richards, Calkins & Holden, Inc.	
*VIRGINIA-CAROLINA CHEMICAL CORP.	55
Agency—Albert Sidney Noble Adv.	
*WESTVACO CHLOR-ALKALI DIV. FOOD & MACHINERY CHEMICAL CORP.	2nd cover
Agency—James J. McMahon Adv.	
*WYANDOTTE CHEMICALS CORP.	26
Agency—Brooke, Smith, French & Dorrance, Inc.	

## tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

BUSINESS OPPORTUNITIES	103
CONTRACT WORK WANTED	103
EMPLOYMENT	103
EQUIPMENT: Used/Surplus New	
For Sale:	103
PROFESSIONAL SERVICES	103
SELLING OPPORTUNITIES:	
Offered/Wanted	103

## ADVERTISING STAFF

Atlanta 3	Michael Miller, 1301 Rhodes-Haverty Bldg., Jackson 3-6951
Boston 16	Paul F. McPherson, 350 Park Square Building, Hubbard 2-7160
Chicago 11	Alfred D. Becker, Jr., R. J. Claassen, 520 N. Michigan Ave., MOhawk 4-5800
Cleveland 13	H. J. Sweger, Duncan C. Stephens, 1164 Illuminating Bldg., 55 Public Square, SUPERIOR 1-7000
Dallas 1	Gene Holland, Gordon Jones, The Vaughn Bldg., 1712 Commerce St., Riverside 7-5117
Denver 2	J. Patten, 1700 Broadway, ALPine 5-2981
Detroit 26	H. J. Sweger, Jr., 856 Penobscot Bldg., WOODWARD 2-1793
Frankfurt/Main	Michael R. Zeynel, 85 Westendstrasse, Germany
London E.C. 4	E. E. Schirmer, McGraw-Hill House, 95 Farringdon St., England
Los Angeles 17	Robert Yocum, 1125 West Sixth St., HUNTLEY 2-6450
New York 36	Knox Armstrong, B. A. Johnson, P. E. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXFORD 5-5959
Philadelphia 3	William B. Hannum, Jr., 6 Penn Center Plaza, LOUcet 8-4330
Pittsburgh 22	Duncan C. Stephens, Room 1111 Henry W. Oliver Bldg., EXpress
San Francisco 4	William C. Woolston, 68 Post St., DOUGLAS 2-4600
St. Louis 8	R. J. Claassen, 3615 Olive St., Continental Bldg., JEFFerson 5-4867

\* "See our catalog unit in the BUYERS' GUIDE ISSUE for 1959-60".

in water and moist air; miscible in hydrocarbons. Suggested uses: catalyst for polyolefins. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide.

## VANADIUM TRICHLORIDE

VC1<sub>3</sub>; Formula Wt., 157.23; M.P., forms VOCI<sub>3</sub> when heated; Sp.G., 3.00; B.P., decomposes when heated. Purity: >97%; Solubility: absolute alcohol and ether; aniline. Chemical properties: violet tabular crystals; decomposes in air and water. Suggested uses: catalyst for polymerization of higher olefins; source of vanadium for organometallic synthesis. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

## VANADYL ACETYLACETONATE

M.W., 261; M.P., near 250 C.; B.P., decomposes when heated in air; Solubility: insoluble in water; somewhat soluble in benzene and chloroform; moderately soluble in acetone and ether. Chemical properties: blue-green monoclinic crystalline solid. Suggested uses: same as ferric acetylacetonate, q.v. Introduced as: product with new degree of availability. Availability: laboratory quantities. Union Carbide Metals Co., Div. Union Carbide Corp.

## VELSICOL W-661 EMULSION

Constituents: hydrocarbon resin emulsion. Solids Content, 53-57%; Wt./Gal., 8.4, 8.5; Viscosity, 42-55 K.U.; pH, 8.0-8.5. Chemical properties: high emulsion stability to various electrolytes and broad range of pH conditions. Suggested uses: latex paints, rug backing, adhesives and latex fortified concrete cements. Introduced as: new chemical product. Availability: commercial quantities. Velsicol Chemical Corp.

## VERSIMINE 50 LIQUID

(N-(2-hydroxyethyl) iminodiacetic acid, disodium salt 50%, aqueous solution)

CaH<sub>9</sub>NO<sub>5</sub>Na<sub>2</sub>. M.W., 221; Contains min. 50% active ingredient (by wt.). Purity: technical grade; Solubility: miscible in all proportions with water. Chemical properties: forms chelates of intermediate stability with most common di- or polyvalent metals. Suggested uses: builder in liquid detergent formulations; copper carrier for algacides; control of metal ions in chemical processing; other applications where metal ion contamination is a problem. Introduced as: new chemical product. Availability: commercial quantities. The Dow Chemical Co., Technical Service and Development Div.

## VINYLCYCLOHEXENE MONOXIDE (1,2-epoxy-4-vinylcyclohexane)

C<sub>8</sub>H<sub>12</sub>O. M.W., 124.18; Sp.G., 0.9598 at 20/20 C; B.P., 169 C (760 mm); Fr. Pt., sets to glass below -100 C; V.P., 2.0 mm. Hg; Visc., 169 cps. at 20 C. R.I. (n<sub>D</sub>), 1.4700 at 20 C; Solubility: in water, 0.50% by wt. at 20 C; water in, 0.65% by wt. at 20 C. Chemical properties: the epoxy ring is opened by water, alcohols, phenols, carboxylic acids, and other reagents containing active hydrogens; hydrogenation gives ethyl cyclohexanol. Suggested uses: chemical intermediate; can be copolymerized with other epoxides to yield polyglycols having unsaturation available for further reaction; copolymerization through vinyl group gives epoxide-containing resins capable of further reaction. Introduced as: product with new degree of availability. Availability: research quantities. Union Carbide Chemicals Co., Div. Union Carbide Corp.

## VINYL PLASTIC ADHESIVE 99064

(modified polyvinyl resin emulsion)

Chemical properties: provides a positive bond; has excellent mechanical stability and does not build up to a sticky mass on rollers or fingers, which is characteristic of many latex adhesives sold for this purpose; dries to a clear colorless flexible film. Suggested uses: water borne adhesive for adhering backed and unbacked vinyl to paper, cardboard and wood. Introduced as: new chemical product. Availability: laboratory quantities, semicommercial quantities. Morningstar-Paisley, Inc., Textile Div.

## VINYMUL EK2553 HS

(polyvinyl acetate copolymer)

Chemical properties: lends full, bulky hand to textiles, where polyvinyl acetate homopolymers normally result in stiff hand. Suggested uses: textile finish. Introduced as: new chemical product. Availability: semicommercial quantities. Morningstar-Paisley, Inc., Textile Div.

## VINYMUL EK3300

(polyvinyl acetate copolymer)

Solids, 55%. Chemical properties: contains hydroxyl groups reactive with thermosetting resins. Suggested uses: durable textile finish. Introduced as: new chemical product. Avail-

ability: commercial quantities. Morningstar-Paisley, Inc., Textile Div.

#### VIRCOL-82

Constituents: organic phosphorus polyol. M.W. estimated ca. 500; Sp.G.  $\frac{7}{4}$ , ca. 1.13. Purity estimated 95-99%; Solubility: inverse solubility with water up to approximately 50 parts per 100 of solution. Chemical properties: enters readily into urethane reaction with isocyanate groups. Suggested uses: flame-retarding co-reactant for polyurethane foams, coatings and castings. Introduced as: new chemical product. Availability: semicommercial quantities. Virginia-Carolina Chemical Corp.

#### 9307 WALLPOL

(vinyl acetate homopolymer resin emulsion) Suggested uses: in paints, paper coatings and textile sizes. Introduced as: significantly new grade. Availability: commercial quantities. Reichhold Chemicals, Inc.

#### WITCO FOMREZ C-1 (stannous 2-ethyl hexoate)

Sp.G. 1.25 gm./ml.; Gardner Color, 3 max. Suggested uses: catalyst for production of urethane foams by one shot method. Introduced as: new chemical product. Availability: commercial quantities. Witco Chemical Co., Inc., Organic Div.

#### WITCO LIQUID 253A

Constituents: aqueous dispersion of a metallic stearate. Sp.G. 8.5 lbs./gal.; Color, white; Solids, 44% wt. Chemical properties: imparts lubricity, roll release during paper coating operation. Suggested uses: paper coating. Introduced as: new chemical product. Availability: commercial quantities. Witco Chemical Co., Organic Chemicals Div.

#### WITCO ZINC STEARATE NB-60, LACQUER GRADE (zinc stearate)

Chemical properties: nonblooming, stir-in grade eliminates bloom or frost in top coats of synthetic varnish containing acid catalyst. Suggested uses: sanding sealers. Introduced as: significantly new grade. Availability: commercial quantities. Witco Chemical Co., Organic Chemicals Div.

#### p-XYLENE- $\alpha$ - $\alpha'$ -DIOL

$C_8H_{10}O_2$ . M.W. 138.16; M.P., 118 C; B.P., 138-143 C at 0.8-1.0 mm. Hg. Purity: ca 98%; Solubility: at 25 C—water 3.3%; benzene, insoluble; carbon tetrachloride, insoluble; n-heptane, insoluble; ethyl ether, 1.7%. Chemical properties: two active hydroxyl groups; white crystalline solid. Suggested uses: manufacture of esters, polyethers, polycarbonates, polyesters; cross linker for polyurethanes. Introduced as: new chemical product. Availability: laboratory quantities. Diamond Alkali Co., Research Dept., Product Development.

#### ZEFRAN® (acrylic fiber)

Chemical properties: excellent dyeability; outstanding pilling resistance; good dimensional stability; pleasing hand in fabric form; good press and pleat retention; wrinkle resistance; resists hole-melting. Suggested uses: staple fiber for spinning into yarns and subsequent processing into woven and knitted fabrics—mainly for apparel. Introduced as: new chemical product. Availability: commercial quantities. Dow Chemical Co., Textile Fibers Dept.

#### "ZEOLEX 23" (sodium silico aluminate)

Sp.G., 2.1. Chemical properties: synthesized fine pigment of silica type to extend titanium, especially in paints. Suggested uses: paint, paper coating, roofing granules. Introduced as: significantly new grade. Availability: commercial quantities. J. M. Huber Corp., Industrial Products Dept.

#### ZERLON 150

(methyl methacrylate/styrene copolymer)

Properties: developed for applications requiring crystal clarity, heat resistance, improved physical properties, outdoor weatherability, and light stability. Suggested uses: for injection molding and extrusion; its uses include automotive applications, lighting diffusers, outdoor signs, control panels and knobs, and packaging containers. Introduced as: new chemical product. Availability: commercial quantities. The Dow Chemical Co., Plastics Dept.

#### ZIRCONIUM TETRAACETYLACETONATE (zirconium tetra-2,4-pentanedate)

Chemical properties: undergoes metathesis with alcohols with formation of zirconium alkoxides. Suggested uses: cross-linking agent for oxygen-containing polymers. Introduced as: product with new degree of availability. Availability: semicommercial quantities. National Lead Co., Titanium Alloy Mfg. Div.

## Tracers

TO THE  
CHEMICAL  
PROCESS  
INDUSTRIES

ADDRESS BOX NO. REPLIES TO: Box No.  
Classified Ad. Div. of this publication.

Send to office nearest you.

NEW YORK 36: P. O. BOX 12

CHICAGO 11: 520 N. Michigan Ave.

SAN FRANCISCO 4: 68 Post St.

#### POSITION VACANT

**Chemist:** A successful plastic extrusion manufacturer in Eastern Massachusetts has opening for a degree chemist to assume responsibility of laboratory on formulation testing, quality control and new product development. Applicant must have industrial experience in compounding of vinyls for extrusions. All replies will be held in strict confidence, P-3546, Chemical Week.

**Primary manufacturer of molding and extrusion** is seeking a Technical Sales Representative for the Midwest area. Chemical or mechanical engineering degree and prior sales experience are desired but not essential. Salary will be determined by qualifications. This is an excellent opportunity for the right man. Send resume to P-3538, Chemical Week.

#### SELLING OPPORTUNITY AVAILABLE

**Mfg's Reps calling on industrial jobbers** wanted to represent eastern mfg's of stainless steel screwed pipe fittings. Sales commission. Choice territories avail. Advise of current lines. RW-3525, Chemical Week.

**Chemical Sales—Expansion creates need** for salesmen in Petrochemical Division of rapidly expanding oil company. Chemical degree and some sales experience necessary. Opportunity for advancement. Send resume to Regional Sales Manager; Delhi-Taylor Oil Corporation; 415 Madison Avenue; New York 17, New York.

#### POSITION WANTED.

**International—American with European experience** and excellent general knowledge of European chemical industry wants position in Europe or U.S. with International Division of chemical company. Well qualified to do market research or follow latest European research and development advances. Currently in Europe. French and German. Twelve years experience in chemical industry. PW-3516, Chemical Week.

**Foreign operations. Widely travelled and experienced** chemical sales executive available worldwide commercial and Government connections. Resume and references. PW-3480, Chemical Week.

#### SELLING OPPORTUNITY WANTED

**Manufacturers Representation, CPI Specialist.** Now serving two leading equipment manufacturers wishes to add one more line that can be sold to the processing industries. Concentration and penetration coverage of Metropolitan N. Y. City—New Jersey, Eastern Pennsylvania and Baltimore area is assured. If you have a reputable product, we can increase your sales at low cost. RA-3514, Chemical Week.

**Want To Sell in The Growing Export Market?** We are fully equipped to handle accounts on an exclusive basis, and invite inquiries from principals in the chemical industry. We are the Import/Export affiliate of Carlisle Chemical Works, Inc., Reading, Ohio, and its division, Advance Solvents & Chemicals, New Brunswick, N.J. Our present principals include: Cadet Chemical Corp., Harry T. Campbell Sons' Corp., Cowles Chemical Co. (Heavy Chemical Department), John R. MacGregor Lead Co. and Titanium-Zirconium Co. If you are a manufacturer of raw materials or intermediates for the chemical process industries, and are looking for active, experienced representation in the export market, write to: Advance International Ltd. 245 Fifth Avenue, New York 16, N. Y. Telephone: Oregon 9-2663.

**Mrs. Agency desires additional lines of specialty chemicals and equipment.** Serving N. C., S. C. and Tenn. process industries and utilities. Equi-Chem Sales Co., Box 4232, Charlotte, N.C.

#### PROFESSIONAL SERVICES

**Clark Microanalytical Laboratory—CH. N. S.** Halogen, Fluorine, Oxygen, Alkoxy, Alkoxide, Acetyl, Terminal Methyl, etc. by specialist in organic microchemical analysis. P.O. Box 17, Urbana, Ill., Empire 7-8406.

**Wisser And Cox—Engineers-Geologists. Mineral** raw materials from exploration to marketing. 55 New Montgomery-San Francisco, California. YU-kon 2-1436. Cables: GEOLOG.

#### CONTRACT WORK WANTED

**Custom Grinding—Ultra Fine or Coarse—Specialty** or Volume Blending and Grinding service on unit or contract basis. Complete CO<sub>2</sub> installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue, Box 682 Oak Lawn, Illinois.

#### SPECIAL SERVICES

**Quality private label paint manufacturer.** Our formulas or yours. Box 128, Bedford, Ohio.

**Research and development for profit.** Present projects include product and process development; chemical product use-evaluation. Two projects now seeking sponsors: (1) Freeze-drying equipment for practical large-scale food processing—\$18,000 (2) High-pressure continuous filter—\$23,000. We prefer to submit project proposals tailored to your company, no obligation of course. Year-long projects \$7,500 and up. Write to us in complete confidence. SS-3567, Chemical Week.

#### BUSINESS OPPORTUNITIES

**Have National Distribution Available! If you** can use capital and successful marketing manpower, we are interested in your product. Write giving full particulars. BO-3178, Chemical Week.

#### CHEMICALS FOR SALE

**Save Money Prime Isobutanol Available in tank** cars or tank trucks. "World's Smallest Producer." Mercury Chemical Corp., Edison, N.J. Liberty 8-1540.

#### FOR SALE

**DBS Plast. Virgin Bulk 35% Barium Hydrx. N.F.** (J. T. Baker Orig.) 15 Leverpaks \$3.06/lb. Triethylene Glycol Dicaprylate 10 drums \$18/lb. Toluol 10,000 gals. \$20/gal. 2 orig. drs. Polyethylene Gly. 1000, Monostearate \$20/lb 3 orig. drs. Barrett Pyridine 15A \$35/lb. O/S 3 drs. Isoprene-Enjay virgin 15%. Ohio Apex KP23 Plasticizer, orig. drs. 12% lb. FS-3452, Chemical Week.

**Butlovak 5' x 12' single drum vacuum dryer,** complete, never used, never installed. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

**Combustion Engineers 2200 gal. T316 stainless** reactor, vacuum int. jacketed, turbine agitator. Perry, 1415 N. 6th St., Phila. 22, Pa.

**Send for revised up-to-date illustrated circular** on our \$3,000,000 chemical plant liquidation at Orange, Texas. Type 316 stainless equip. Perry, 1415 N. 6th St., Phila. 22, Pa.

**For Sale—16—8100-gal. cap. ea. "Lastiglas"** lined horizontal tanks, price 10¢ per gal. i.o.b. truck shipping point, buy one or more, inspection invited. FS-3464, Chemical Week.

**For Sale—150 HP package-type steam generator** in closed food plant Michigan, automatic oil burner and all controls, still erected. FS-3457, Chemical Week.

**For Sale—Diatomaceous earth filter with "Nag-**ara" stainless riveted lenses, 160 sq. ft. area. FS-3460, Chemical Week.

**For Sale—"Alvey" automatic pelletizing ma-**chine, new 1954, cost new around \$30,000, can ship immediately at less than half price, ideal for oil, chemical packages, etc. FS-3469, Chemical Week.

**Centrifugal—Tolhurst 32" suspended type. Bot-**tom discharge. Imperforated basket and shaft, both of stainless steel. Also stainless pump. Complete with seven and 1/2 H.P.M. 900 & 1800 RPM, 220/440 volt and controls used excellent condition. Deming Machinery Company, 14400 Liver- nois, Detroit 38, Mich. To 9-9676.

#### WANTED

**Small laboratory furnace for temps up to 2500°C** either atmosphere or vacuum. W-3488, Chemical Week.

**Machinery Wanted: 66" high side Raymond mill** in good condition. Write Wyo-Ben Products, P.O. Box 1979, Billings, Montana.

#### WANTED/FOR SALE

**This Tracer Section can be used whenever you** are looking for or offering Equipment, Plants, Supplies, Chemicals, Opportunities, Special Services. The rates are low—just call or write Classified Advertising Division, Chemical Week, P.O. Box 12, N. Y. 36, N. Y., Longacre 4-3000.



## Week

1959 OUTPUT INDEX

1959

1959 PRICE INDEX

1959

JANUARY 30, 1960

### WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-1949=100)	216.8	216.5	193.0
Chemical Week wholesale price index (1947=100)	111.5	112.6	110.8
Stock price index (12 firms, Standard & Poor's)	56.84	58.92	50.12
Steel ingot output (thousand tons)	2,712	2,727	2,056
Electric power (million kilowatt-hours)	14,236	14,308	13,324
Crude oil and condensate (daily av., thousand bbls.)	7,146	7,112	7,087

### TRADE INDICATORS (million dollars)

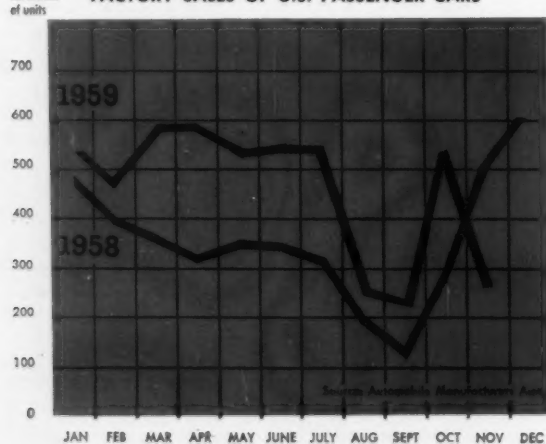
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All manufacturing	21,199	29,384	27,467	51,530	51,515	49,297
Chemicals and allied products	2,248	2,219	2,023	4,056	4,037	3,767
Petroleum and coal products	3,234	3,037	2,819	3,275	3,295	3,324
Paper and allied products	1,012	1,006	936	1,495	1,481	1,419
Textile products	1,214	1,197	1,102	2,500	2,536	2,456

### Manufacturers' Sales

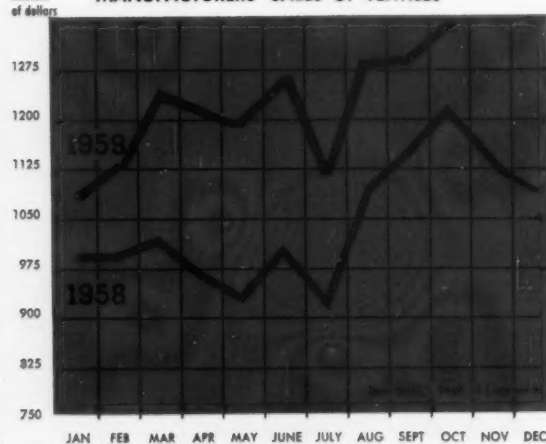
### Manufacturers' Inventories

### CHEMICAL CUSTOMERS CLOSE-UP

#### FACTORY SALES OF U.S. PASSENGER CARS



#### MANUFACTURERS' SALES OF TEXTILES



*airborne silica . . . . . it's white magic!*

**5-second  
test proves  
CAB-O-SIL®**

*Try the 5-second test for yourself:*

- 1) start with caky powder (it's sulfur here).
- 2) add just 0.5% Cab-o-sil by weight.
- 3) shake vigorously for 5 seconds.
- 4) voilà! — you have a smooth, free-flowing powder!

What simpler way to prove for yourself the genuinely amazing conditioning effects possible with just a pinch of Cab-o-sil on caky powders? Cab-o-sil has already proved highly effective not only with sulfur, but with a wide variety of "problem" powders including urea and zinc oxide, insecticides, and rubber accelerators.

**works  
"free-flow" magic!**

And here's a notable fact to remember: Cab-o-sil does the job in spectacularly minute amounts — as little as one quarter of one per cent by volume in some cases.

Anticaking is just one of a long list of immensely useful characteristics of this versatile raw material. Here are a few of the ways Cab-o-sil is currently being put to work:



**We invite you to use the coupon below.**

Minerals & Chemicals Div., CW **GODFREY L. CABOT, INC.,** 125 High Street, Boston 10, Mass.

**USES:**

- Thixotropic, thickening, gelling agent — lubricating oils, greases, polyester resins, epoxy resins, plastisols, plastigels, organosols
- Suspending agent — paints
- Flatting agent — varnishes, lacquers, organosols, plastisols
- Reinforcing agent — rubber, silicone, latex film
- Anticaking agent — sulfur, insecticides
- Antislip agent — solvent-base floor waxes
- Precoating material — reproduction paper
- Low temperature thermal insulation
- Pharmaceuticals and cosmetics — (See bulletin #cpha-1)

Please send ☐ free Cab-o-sil sample and other technical data checked

NAME .....

TITLE .....

COMPANY .....

ADDRESS .....

**Technical data available:**

- ( ) General Properties, Functions and Uses (#cgen-1)
- ( ) Cab-o-sil in the Rubber Industry (#crub-1)
- ( ) Cab-o-sil in Butyl Rubber (#crub-2)
- ( ) Cab-o-sil in Dipped Latex Films (#crub-3)
- ( ) Cab-o-sil in the Lubricating Grease Industry (#cgre-2)
- ( ) Aqueous Dispersions of Cab-o-sil (#cmis-2)
- ( ) A Flatting Agent for Varnishes (#cpai-3)
- ( ) Cab-o-sil in the Reproduction Paper Industry (#cpap-1)
- ( ) Cab-o-sil in the Plastics Industry (#cpla-2)
- ( ) Cab-o-sil in Automobile Polishes (#cpol-1)
- ( ) Cab-o-sil in Pharmaceuticals and Cosmetics (#cpha-1)



## TITANOX® helps bring smiles to the kitchen

Rubber and plastic products, like these by Rubbermaid® and other manufacturers, bring smiles to the kitchen. And TITANOX white titanium dioxide pigments, in turn, bring smiles to compounders and processors of all types of rubber and plastics.

For TITANOX pigments, particularly TITANOX-RA, help maintain efficiency in production and uniformity of white and light colored products that make consumers happy.

There are one or more types of TITANOX white pigment—rutile and anatase titanium dioxides, and also titanium-calcium—not only for rubber and plastics, but for everything that needs white pigment . . . paint, paper, inks, porcelain enamels, textiles, leather and building materials, to name some. Titanium Pigment Corp., 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities. In Canada: Canadian Titanium Pigments Ltd., Montreal.

**TITANIUM PIGMENT CORPORATION**

SUBSIDIARY OF NATIONAL LEAD COMPANY





